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ABSTRACT

Investigation and coordination of research on various aspects of the reading process were the first purposes of Project Literacy. These programs in their various stages of development have been reported in nine issues of the Project Literacy Reports which are now available from ERIC. The development of a first-grade reading program was started simultaneously with the research programs because it was felt that classroom problems could be further explored through research and vice versa. Since the intent of the program was to search for ideas and to exchange insights of the laboratory and classroom, the small sample used was worked with very intensively. It was composed of three heterogeneously grouped grade-1 classes of about 23 children each, from a suburban and rural school, the latter group being preselected. The first-grade program described centers around a curriculum stressing prereading, codes, and skills. The over-all program is composed of reading, sound-spelling correspondence, handwriting, and a literate environment which are fully discussed. The report contains a section on the observer in the classroom and an analysis of reading errors and strategies of information use, stressing qualitative changes in children's reading errors. Appendixes, tables, and references are included. (CL)

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FINAL REPORT

Project No. 50537
Contract No. OE 6-10-028

PROJECT LITERACY: CONTINUING ACTIVITIES

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September, 1969

U. S. DEPARTMENT OF
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Project Literacy: Continuing Activities

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Please specify the appendix by letter and number and enclose a large, self-addressed stamped envelope.

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Preface

Project Literacy had a number of purposes. The first was to investigate and coordinate research on various aspects of the reading process. These programs in their various stages of development have been reported in nine issues of the Project Literacy Reports. These reports are now available from ERIC. The naivete of our first notions about the relationships between educational research and classroom practices was soon apparent. Rather than considering research and development as successive phases, we decided to start the development of a first grade reading program almost simultaneously with the research programs. We thought it possible that problems encountered in the classrooms should be communicated to the laboratory and, at the same time, the implications of laboratory findings could be drawn rapidly for classroom practice.

This report describes the first grade program which evolved. During several summers, extensive curriculum development seminars which brought together researchers and teachers were convened. We are indebted therefore to the seminar participants whose wisdom and enthusiasm were reflected in our work.

Since our intent was to search for ideas and to exchange the insights of the laboratory and classroom, our strategy was to work very intensively with a small number of classrooms. We think of this as a cross between clinical and quantitative research. The intensity of our involvement with a few classrooms meant that the basic research group that evolved worked closely with each other over a long period of time. We want to thank these people for their dedication. The Ithaca School System was generous with their time and facilities. The teachers who were members of the Project were Saundra Dyer, Caroline School, and Beryl Cushman, Belle Sherman School, Ithaca, New York. Observers and curriculum writers were Barbara Sadoff, Linda Roberts, Mary Sue Ammon, Sylvia Gilmore, and Jean Simmons. Dr. Andrew Biemiller, now at the Institute of Child Study, University of Toronto, was responsible for the evaluation of the reading program. He is responsible for Chapter 8. Mary Blomgren and Cecile Clancy were dedicated secretaries. We wish to thank these and other project members.

Chapter I

Background and Overview

Project Literacy was organized at Cornell University on February 1, 1964, by a developmental projects award from the Cooperative Research Branch of the United States Office of Education. The purpose of Project Literacy was to organize, in various universities, laboratories, and state departments of education, research essential to understanding the acquisition of reading skills. The major initial effort was to bring together researchers and educators from a variety of disciplines to plan research which, when taken as a whole, would give us more substantial results than uncoordinated studies could provide. Each investigator in the research consortium was completely responsible for his own activities but the Project provided mechanisms whereby the individual scientists could communicate their research strategies, problems, and results to each other, and meet together when necessary.

Purpose of the Study

One program supported by Project Literacy was the First Grade Reading Study. The First Grade Study was initiated when it became apparent that no matter how many experimental studies were conducted, or how important their results, it was only through looking at youngsters learning how to read in actual classroom settings that the relationships among the relevant, complex variables could be observed.

Certain learning behavior is best studied experimentally so that the effects of one or more designated variables can be isolated. There comes a time, however, when the built-in narrowness of scope of such studies necessitates looking at the learner and charting the full range of influences which produce outcomes. One reason for doing so is that even when an experiment can specify the ingredients which should go into a good reading program -- like the ingredients of a cake (and so far research has only indicated that several cakes are possible), it cannot yet give us the recipe. To carry the analogy further: does success in reading require a tablespoon of positive reinforcement or a pound? Is one allowed to substitute i/t/a/ for a phonics program? Do you begin with meaning and then add phonics, or vice versa? Neither the total number of ingredients, the exact quantities, nor the best mix have as yet been specified.

Intensive observation of a few children produces information that differs qualitatively from the usual research study. With this method, a more complete description of a child's progress can be charted; problem areas can be identified for individual children and groups of children; the methods of presenting materials can be compared, as well as the value of the written worksheets and independent work which comprise so much of a first grader's school time. New ways of approaching the teaching task can be tried out, evaluated, revised, and re-tried in a much shorter period of time than is usual. The data collected in such a study, however, should be presented descriptively for the most part, and the exact contribution of each program segment left to laboratory research. Such a study, then, can sometimes produce a list of ingredients for one kind of cake, but not all possible cakes.

There is another way in which this type of approach can work in conjunction with experimental methods. By intensive observation, one is able to spot certain problems in theory, in practice, or in materials which can then be brought to the attention of the researcher for study under the usual controlled conditions. The current procedure is for the researcher to choose an area of particular interest to him, study it, and present his findings to the educational world. In this way, valuable contributions have been made. But there are still a variety of puzzles and problems to be resolved which appear most clearly only in a classroom setting. One of the objectives of this study, then, was to identify and isolate fruitful areas for further research.

The complementary nature of experimental research and classroom innovation, observation, and evaluation should be obvious. The use of both styles simultaneously was our aim.

Plan of the Study

A year of observation in a public school first grade was followed by a month long summer curriculum writing seminar, which in turn was followed by two years of innovation in first grade classrooms in the Ithaca, New York, school system. After the first year of innovation a second summer seminar was held to evaluate and suggest further revisions in the program.

The Year of Observation

During the school year 1964-1965, a linguist and a psychologist made daily observations in a first grade classroom.

The children in this class had not been pre-selected nor had the teacher (although the teacher, of course, had consented to being observed). The reading program followed the outlines in the Scott-Foresman teacher's manual, while the full language arts program conformed, in general, to what has been recommended by leading educators of the 1940's and 1950's.

The teacher, the two observers, and the director of Project

Literacy met weekly. During these meetings, the theory and purpose of the lessons were discussed, as well as children's progress toward the goals set by the program. Various strengths and weaknesses of a basal-reader program in action were considered.

During the year, both observers noted the children's errors in oral reading; and during the second half of the year, individual children periodically recorded their oral reading. These data later became the basis for a categorization of children's reading errors (Weber, 1966).

This first year of intensive but non-interventive observation provided the opportunity for planning innovative approaches to the tasks of learning to read.

The First Summer Seminar

In the summer following, (June 15 - July 15, 1965), a seminar in curriculum writing was held at Cornell University. Those invited included classroom teachers; professors of linguistics, psychology, and education; and graduate students in each of these fields. (See Appendix A-1 for list of participants.) At the end of the seminar, a number of assumptions -- or postulates -- about an optimal reading program were agreed upon by the members.

The postulates

The fundamental strategy was to investigate the competencies of the skilled adult reader, based upon: (1) theoretical ideas and data concerning the way in which people comprehend spoken and written language; (2) empirical observations of mistakes made by inexperienced readers; and (3) theory and data concerning perception and learning.

The seven postulates listed below summarized our thinking at the end of the seminar and set out the guidelines for the development of the instructional program.

1. A child must have certain preliminary skills before reading instruction is begun. There are two basic components to the preparation:
    a. the understanding that reading is a means of communication, and that the written representation is a code for language.
    b. Adequate discrimination skills, both visual and auditory.

    It follows that it would be desireable to include an introduction to the basic notions of coding in the pre-reading phase. The main focus of such a program would be the demonstration of different means of coding in order to point up the fact that writing is a flexible and useful code for spoken language.

2. The competent reader has three kinds of information available to him as he reads:
    a. phonological constraints (spelling-to-sound correspondences)
    b. syntactic constraints (grammatical structure)
    c. semantic constraints (meaningfulness)

The beginning reader already has some of the skills required for reading as described here. Insofar as he can understand spoken English, he can utilize information gained from syntactic and semantic constraints. He has only to apply these to reading. For example, the grammatical structure of "He stopped his car at the red ...." places great limitations on what follows. In this example, it is highly likely that the next word will be a noun. In addition, the meaning of these words constrains the remainder. It is probable that the next word will be "light", and very improbable that it will be "justice."

On the other hand, the beginners must learn to use spelling-to-sound correspondences; there is nothing in language behavior or other content previously acquired by the child that will transfer to this aspect of the reading task.

The curriculum will be designed to provide a balanced development in the use of the three kinds of information. At no time should the child learning to read fall into the use of one of these sources of information at the expense of the others. The reader must be flexible in using all sources in order to ensure success in the various types of reading matter which require greater emphasis on one or another of the sources.

3. The beginning reader should be given simultaneous training in using all three types of cues. This follows from the notion that when teaching a complex task it is preferable to start training on the task itself, or a close approximation to it, rather than giving training on each component skill independently and then integrating them.

One implication of this postulate is that there should be no separate spelling program or handwriting program per se, but that this instruction should be fully integrated into the reading program.

    a. At any stage, training should be provided in several different contexts over a wide range of materials.

b. Because of the large individual differences in ability, it may be necessary to provide additional training for some students. This may be similar to the initial instruction, or it may involve the use of subroutines designed to provide specific instruction in using a particular type of cue.

4. The child must learn to approach the reading task with the understanding that there is variability, i.e., he should acquire a "set for diversity." Thus, for example, if more than one phoneme is represented by a single grapheme, the child should be introduced to both correspondences very early in training.

5. The child should encounter sentences from the very beginning of training, because this is the minimal unit which (1) ensures comprehension and (2) provides all three types of information. A differentiation model will be followed, i.e., the complete sentence will be introduced first and then will be broken down into its component parts.

6. The relationship between reading and language must be made clear from the beginning, through natural intonation, emphasis on reading as a means of communication, and so forth.

7. The classroom should constitute a "literate environment." Exposure to language and reading-related activities should not be restricted to periods of formal instruction. The beginning reader should also be shown what skillful reading is like, through frequent exposure to adult reading of material interesting to the child.

   The curriculum should reflect the assumption that children come to reading instruction with rich language abilities which instruction should capitalize on. Moreover, beginning reading skill can be acquired not only through direct, formal instruction, but also through informal contact with various activities and materials in the classroom.

   The use of story charts, class newspapers, displays, discussions, and other means of emphasizing communication, should accompany direct instruction in order to advance the development of language and reading skills.

The First Year of Innovation

In the fall of 1965, the Project Literacy (PL) staff began to set up lessons based on the postulates. (See Appendix A-2 for PL staff.) In some instances commercial materials were thought to be suitable; in others, materials had to be constructed. These materials were immediately tried out in a first grade classroom.

The staff consisted of a first grade public school teacher and three research associates. Two of the PL staff members worked full time and one half time. The half time person worked mainly to develop materials in sound-letter correspondences, and one full time staff member spent half a day observing in the classroom and half in processing observations, collecting materials, and so forth. The third staff member was responsible for the direction of the project. The teacher met with other members of the staff one afternoon weekly, and informally at other times.

The Second Summer Seminar

After the first year of classroom innovation, a second summer seminar was held. Again, educators, psychologists, linguists, teachers, and graduate students participated. More than half of the first summer's group attended the second meeting. The second seminar differed from the first in that it focused on the report of the first year's findings and was thus more evaluative than speculative. Many suggestions for change, however, were discussed. At the end of the summer, a report was issued incorporating the most salient contributions of the members.

The Second Year of Innovation

In the fall, a second classroom try out began. The same teacher and first grade were observed, and another classroom was added. This second classroom was in a rural area eight miles from Ithaca and the children chosen were those incoming first graders judged to be "least ready" to read on the basis of kindergarten teachers' judgments which, in turn, were partly based on results of a reading readiness test. The PL staff was increased by adding another teacher and observer, and by adding two half-time graduate students to process data.

Curriculum Content

The program for both years was, in general, the same. Here, an overview will be given. Subsequent chapters will describe each part of the program in detail.

Pre-reading

The first postulate of the summer seminar concerned skills prerequisite to reading. There were two levels of training thought necessary. At one level was the general understanding of the writing system as a type of code for language. Given this understanding, there would follow the second or skill level, where work on auditory and visual discrimination takes place.

Codes

Writing is a code which has the characteristics of arbitrariness, order, and a pattern of relationships to the sounds of the language. During the first few weeks of the first year's try out the children learned through a series of a half dozen lessons that gestures can stand for language, and lights and sounds can be used as codes for language, too. They learned about arbitrariness and order in codes by making up their own codes using abstract symbols (squares, triangles, circles, etc.) to stand for sentences, then for phrases, then for words. The number of abstract symbols was deliberately built up to overload the memory, and at this point the teacher introduced a new code, the alphabet, based on the sounds of the language. The interest of the first graders and the further possibilities of such a series of lessons prompted us to plan a more specific sequence of lessons which were tried out in two kindergarten classes in the spring of the first year's try out. After revising certain sections of the Unit, we conducted a further try out in two classrooms in New York City during the spring of the second year. The Coding Unit is discussed in detail in Chapter II.

Skills

To learn what reading skills the children had when they entered first grade, tests were given during the first few weeks of school. The tests included letter naming, auditory discrimination, listening tests, and tests of other specific abilities. Based on the results of these tests and classroom observations during September, the students were tentatively placed in small groups, either to begin to learn to read, or to be given work in some of the reading skills they were deficient in. Description of the tests and the findings are reported in Chapter III.

The Main Program

The over-all program had several major aspects:

1. The Reading Program
    a. initial teaching: last section of Coding Unit; teacher composed sentences; nursery rhymes
    b. reading texts
    c. trade books (one-of-a-kind published stories)
    d. staff-prepared materials
    e. sub-routines

2. Sound-letter Correspondence Program
    a. sequence of teacher-led lessons

   - b. worksheets correlated with the lessons
   - c. commercial material (first year)
   - d. sub-routines

3. Handwriting
   - a. sequence of teacher-led lessons
   - b. worksheets correlated with the lessons
   - c. supplementary activities

4. Auxiliary Program -- literate environment
   - a. electric typewriter
   - b. tape recorder
   - c. printing press (second year only)
   - d. felt letters, magnetic letters
   - e. message board
   - f. bulletin board, chalk board, slot-chart
   - g. riddles, stories, extra reading material

Each of these areas will be taken up in detail later in the report. Here, a brief explanation will suffice.

Reading

Initial teaching

It was decided that the child should encounter sentences from the beginning, since the sentence is the minimal unit which both ensures comprehension and provides all three types of information (semantic, syntactic, and phonological). Therefore, while the individual testing was going on, the teacher proceeded from the coding unit into the first whole-class reading and phonics lessons.

Since we had decided that the relation between reading and language should be made clear from the beginning, the first reading experience involved utterances by student and teacher. The children's sentences took the form of group produced stories, each of which was the outcome of a classroom experience.

At the same time that the children were getting used to seeing their own words in print and learning to see separate words in sentences, the teacher began to write simple sentences on the chalkboard concerning classroom organization or content; such things as the weather, the attendance, colors, classroom helpers, and days of the week. These sentences were put on oak tag and displayed on various bulletin boards and charts where they could be reviewed daily. This procedure was far more successful than relying completely on student-produced utterances.

Nursery rhymes were copied onto chart paper and provided a vehicle for beginning work with rhyming and for exercises such as: pointing to individual words as they were being read, matching words that occurred more than once in a verse, or recognizing words that began with the same sound. A few children quickly learned these rhymes by rote and could "read" them in a short time.

After a few whole class lessons plus small group sessions to check on understanding, the teacher introduced the first reading text to small groups who were judged to be ready.

Reading materials

The first book

Many pre-primers and primers are written to introduce and repeat a small vocabulary, and therefore they were not thought to be useful for our purposes. During the first year we used the primers from a new English series called The Ladybird Key Word Scheme* as our initial text. As pre-primers go, this one is a cut above most and after the first page or two, the pictures very rarely cued the text directly. We liked the fact that this text used from the very beginning writing and phonics as tools which could be related to the reading task.

Another series came to our attention during spring term of the first year. The Chandler Series' initial teaching materials consist of soft cover booklets containing black and white photographs of San Franciscan children of several races. Each booklet centers on a theme, such as bikes or supermarkets. The text on each page consists of conversations by the children depicted in the accompanying photograph. During the second year, we used these texts initially with all children, and reserved the Ladybird books as extra reading for the suburban class beginners who were able to learn and retain more material at this early stage.

Other materials.

After the initial teaching and exposure to the Primers just mentioned, we found it necessary to improvise, since the children were not yet ready for other published materials we had found. The texts we had chosen contained a heavy vocabulary load, so they could not be used until the children had more power to attack words independently, and had built up a few more automatic responses to frequent words. We used two strategies to bridge the gap.

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* All materials used in the program appear in Appendix A-3.

1. both regularity and diversity should be stressed at appropriate sequence points;

2. concentration would be on the individual consonant letter with correspondence to one sound value;

3. sequence of presentation would depend on visual and auditory contrast, frequency of use, and possibilities of combination.

During the first semester of the first year, commercial materials were sought that could be altered to fit our sequence of letter presentation. It was found, however, that special materials were needed since each existent system builds on what it has previously presented. During the second semester, sets of lessons were prepared that would follow the sequence we had set up.

At the same time, two students who were not benefiting from regular instruction were given the Sullivan Programmed Reading materials as their major reading and phonics text. One of these two children was able to rejoin a regular reading group before the end of the year.

During the second summer seminar we revised the sequence in which letters were introduced, and decided to introduce consonants in words rather than in isolation. Other content was added to the program as well.

In the second school year, the children were given staff-prepared lessons from the beginning, with only occasional supplementary commercial materals. It was found that the PL lessons were useful for both the suburban and the rural classrooms but that the rural children needed much more practice than was being provided by the materials as originally written The PL correspondence program was postponed in the rural classroom for many children until they had practice in pre-reading skills. Various commercial and home-made exercises were used to build perceptual readiness during this period. And during the course of the year, several sub-routines were written and tried out with students who were having trouble. The progress of the children in the correspondence lessons is discussed in Chapter IV.

Handwriting

Since the beginning reader should be given simultaneous training in using all three types of cues, the implication is that there should be no separate spelling or handwriting program, per se, but that this instruction should be fully integrated into the reading program. Although, during both years, many exercises were written to provide for such an integration, it was found that skill in handwriting progressed very slowly.

Several members of the second summer seminar became interested in the handwriting problem, and some pilot studies were carried out with a Head Start class operating at the time locally. As a result of this interest and activity, a complete handwriting program was prepared during the summer months for try out during the second year. This program attempted to coordinate letter introduction in the handwriting and correspondence programs, and to introduce many activities involving handwriting that would also strengthen skills and concepts being taught in other parts of the program.

Because members of the seminar were unconvinced by existing evidence concerning large and small muscle coordination, several experiments were built into the new handwriting program to test these assumptions.

A complete description of the handwriting program appears in Chapter V.

Auxiliary Program - Literate Environment

An early decision of the first summer seminar, reaffirmed in the second, was that the classroom should constitute a "literate environment", that is, exposure to language and reading related activities should not be restricted to periods of formal instruction. The beginning reader, we felt, should have informal contact with various language related activities and materials.

A variety of techniques were utilized to create such an environment in the classroom. To emphasize the communicative aspects of reading, we titled bulletin boards, wrote simple directions in the form of statements on all worksheets; and in every way tried to permeate the school day with activities calling for reading and writing. Since the richness and complexity of a six year old's language far outstrips anything he will be able to read for some time, we wanted to provide good literature for him to listen to, both to introduce good writing style and content, and to give a good model of oral reading. Toward this end, during the initial period of the first year, one activity was begun which later became an integral part of the program. The teacher introduced the whole class to tape recorded stories. After this, individual children, one or two a day, put on the earphones and listened while looking at the book. When we realized how profitable this activity was, we attached multiple earphones so that six children could listen to a story simultaneously. During the two year period, the tape recorder was put to many different uses.

An electric typewriter with bulletin type was another successful venture. Introduced tentatively, it soon became a popular and instructive activity. In the fall of both years, individual children used the typewriter for matching lower and upper case letters, copying their names, and the like. Later, children began to write their own sentences or to complete a story. Materials were prepared for use with the typewriter so a child would have a choice of several activities when his turn came.

A third effort to deal with technology in the classroom occurred the second year when two printing presses arrived just before Christmas. These were used immediately, in both classes, to make Christmas cards. After Christmas, children were helped, singly or in pairs, to compose their own messages. This activity became a major free time occupation for some children in each of the classrooms.

Aside from the "hardware" that we tried out, many of the ideas to provide a literate environment were quite simple but successful. The use of felt letters and magnetic letters was extremely profitable during the first months before many children could handle handwriting skills. A message board was used for a month or two during the second semester so that children could pass messages back and forth. Occasionally students by-passed the board and sent notes directly. (In some classrooms the teacher confiscates notes, but we wanted to encourage this sort of spontaneous communication.) Other short-term activities included bulletin board displays or individual pictures to stimulate group stories or answer simple questions.

The literate environment is discussed in detail in Chapter VI.

Descriptions of the classroom

Suburban School

The children -- the first year

We worked with a first grade containing a heterogeneous group of 23 children, 13 boys and 10 girls. A new pupil in April raised the total of girls to 11. The school served a middle to upper middle class residential area and contained two or three rooms at each grade level from kindergarten through Grade 6. Our first impressions of the children in the classroom were that they were articulate, outspoken, and curious; they seemed somewhat highstrung, were easily bored, lacked self-restraint, patience, or concentration on a given task for any length of time. A group I.Q. test administered by the school in September (Thorndike-Lorge) indicated a mean I.Q. of 110.5 and a range of 85-124.

The children -- the second year

The first graders were again grouped heterogeneously. This year there were 24 students in the class, 13 boys and 11 girls. One of the girls was a five-year-old who had been enrolled in Kindergarten but joined first grade at the request of parents and the recommendation of the school psychologist. In June, two Spanish-speaking boys joined the class. By temperment, the children this year seemed to have more self control and, in the main, tended to cooperate rather than compete with each other. They were, however, outspoken, unrestrained, and impatient on occasion, as are most six year olds still learning how to work alone and with others. They could always be depended upon to tell you when they were bored, tired, didn't understand, or conversely, when they enjoyed an activity, or had learned something that excited them. This outspokenness did not make for an absolutely quiet and well-ordered classroom at all times; frequent checks, however, assured us that the children were learning under these conditions during both years. They were certainly comfortable and happy in the classroom.

The teacher

The first grade teacher had a master's degree in Education and four years of experience, three of which were in the same school. Our impressions of the teacher were that she was sensitive to children; gave individual help often; tried to involve students in a positive manner; reinforced correct responses; and used approval in class management and discipline. Although there was an atmosphere of permissiveness within the class, the school day was regularly structured and lessons for the day were always planned. In short, the teacher made this room a very comfortable place for first graders to be.

The observer - first year

One full time research associate served as observer in the classroom. Her role is explained more fully in Chapter VII. In brief: the observer recorded all language arts activities that occurred in the classroom during the morning session. For the first few months of school, she remained passive in her relationship to the children in order to allow the teacher to form the primary relationship with them. In later months, the observer, besides recording data from several reading groups each day, kept a list of a variety of language activities as they occurred. She also did all individual and small group testing, and supervised language activities of small groups or individuals not engaged in a reading group. The observer came to be regarded by the children as a combination sub-teacher-older-sister, and although they frequently turned to her (or indeed any stray visitor) to help spell a word or answer a question, she never interfered with the teacher's position as the authority in the classroom.

Besides spending time in the classroom, the observer collected materials from the central school library, prepared materials for the language activities, worked on some of the phonics lessons, prepared and corrected diagnostic testing material, and compiled the daily records and work samples from which weekly summaries were prepared.

The observer - the second year

The observer had had previous teaching experience in English-speaking Canada and was working toward a teaching certificate in the United States. She filled the same role as the observer the previous year and was able to be efficient and helpful to the teacher in a number of small ways because of her background.

The Rural School

The children

In this classroom, the children were pre-selected. Their principal and kindergarten teachers expected that each would have trouble learning to read. This judgement was based partly on results of a New York State Reading Readiness Test administered the previous spring, partly on observations of kindergarten classroom behavior. There were 20 children in all, 10 boys and 10 girls. One of the boys had been assigned to the "average" classroom, but because he was a discipline problem in that classroom and because his achievement was borderline for that class, he joined the PL class for reading every day. At Christmas, one girl (from the top reading group) moved away, and after Christmas one girl moved into the district and was placed in this class because of low achievement.

The children were charming. They were as neatly groomed and well dressed, with one or two exceptions, as any child in the suburban class. There were several discipline problems evident from the beginning but these were handled by the teacher with good humor and firmness and each episode was treated separately. Thus, there was rarely a real disruption and such episodes decreased rapidly during the fall months.

For the most part, the children wanted and received personal affection and attention from the teacher. They were more affectionate and less independent than the suburban youngsters, and more personal in their approach to visitors. At the same time, there was more timidity and some anxiety over learning -- more seeming disinterest at the wrong answer or even a giving up entirely after one try. This apparent passivity during learning was very hard to overcome. When learning did occur, the individual was jubilant, far more so than his suburban counterpart.

By comparison with the suburban children, these youngsters were thinner, smaller, and were absent more. An indication of special problems shows up in a set of comments that we gathered during the year.

Child A. sleeps a great deal in class: speech problem
B. both parents white; mulatto child
C. crossed eye; very shy
D. asthma; temper tantrums
E. loss of hearing; retarded; speech problem
F. breech birth and slow to breathe at birth
G. loss of hearing in one ear; home problems
H. hearing loss; extreme speech problem
I. much sickness; listless
J. crossed eye - will have surgery later
K. repeating Grade 1

Most items in the list above concern health problems. Another indication of possible health problems derives from the attendance records. Of a possible 179 days of school, the rural children averaged 161.5. (The little girl who arrived in this class in January is not counted in this tally. She missed 25 days from January to June.) In contrast, the suburban children averaged 168 days of attendance, and when attendance of one child (who was out for 44 days on a trip) is removed, their average rises to 173.5 days.

The teacher

This teacher had taught in elementary schools in and around the Finger Lakes District for years. She had volunteered to take the "High Risk" readers in conjunction with the PL program. Skilled in handling children, relaxed under duress, patient with slow-learners, lavish with praise for small gains, firm but not rigid about appropriate classroom behavior, with a ready sense of humor, interested in trying new techniques and strategies, this was a most competent and secure teacher. The children all loved her.

The observer

The observer in the rural school had just received a master's degree in Child Development from Cornell and was a full-time research associate for the year. Besides observing half-days in the classroom, she prepared special reading activities and exercises for the rural classroom, and worked out most of the lessons for the slowest moving reading group.

Data Collection

In order to study the effectiveness of our program and to learn more about changes in skills during the first grade, we gathered a great deal of information of various sorts about children in our program and some information about children not in our program.

Classroom observations, tests, and worksheet performance were used to evaluate the children's initial abilities, and these formed the base line to use in estimating changes in performance during the year. We hoped to be able to determine from our observations and performance records how well particular lessons held the children's interest, whether lessons were overly difficult or easy, and whether children were in fact learning what we expected them to learn. In addition, we wanted to assess competencies at certain points during the year. Some of these assessments were based on special tests, others on observation of regular classroom activities. The initial assessments of incoming reading and language skills that were made in September are discussed in Chapter III.

During the year, we kept records of accuracy in oral and written classroom performance; we gathered samples of handwriting, typing, and printing work; and we gave oral reading and correspondence tests which are described below.

1. Oral reading tests. Two sets of oral reading passages were used. One set was given in November, January, and March. The other set was given in April and May. Each set of passages included alternate forms so that children would not read the same passage twice

2. Oral reading comparison test (given in June). Four passages were used. These were developed from vocabulary used at the primer level in both PL and non-PL classes. The easiest passage was completely restricted to this early vocabulary that most children in both classes had experienced. The remaining passages had progressively smaller proportions of this common vocabulary. Six classrooms, including the two PL classrooms, were tested. The results of the reading tests are discussed in Chapter III.

3. Oral phonics reading tests. Associated with the regular oral reading passages were passages based on vocabulary taught in the phonics curriculum. These passages were also given in alternate forms.

4. Sound-letter correspondence tests. In February, dictation tests were given. The children filled in the missing letter in a word on their papers when the teacher said the word. Selected consonants and vowels were tested in various positions. A spelling test was also given.

5. Sound-letter correspondence comparison test (given in June). The same procedure was used in June as in February. Seven classes, including the two PL classes were tested. The results of the correspondence tests are discussed in Chapter IV.

Classroom Observations

We devised measures to gather data on attention, interaction with the teacher, oral reading performance, and written production.

Attention

Looking at the teacher or other speaker, or following in a book, if appropriate, were the criteria of attention.

The procedure involved scanning the whole group (of whatever size) for thirty seconds, noting any children who were not attending. The next thirty seconds were spent rechecking only those children not attending during the first thirty seconds. If inattention was observed for over half of the second interval (15 seconds), this again was noted. Thus, for each moment, three degrees of attention could be scored: full attention; some inattention; and considerable inattention. This sequence was repeated in successive intervals of up to ten minutes. Although a child who was scored as attending during Period One was not rechecked during Period Two, we felt that if he had seriously stopped attending, this would be observed in the next cycle. Forms used for recording attention are given in Appendix A-4.

Use of Attention Data

Attention data from small groups and whole class observations were summarized by adding separately the number of single and double inattention observations on each child. Attention during each time interval was also noted. Our subjective impression was that only the double observations indicated real inattention. These data were then used to determine profitable session lengths (inattention increases fairly rapidly towards the end of sessions) and to compare individual attention scores with performance.

Although we did find evidence of a relationship between attention and performance, and indications of increasing inattention during long lessons, we eventually stopped using attention observations for two reasons. First, we were never satisfied with the reliability of our observations, primarily because of criterion problems (e.g., is tying a shoe inattention? Maybe not.). Second, observations of performance proved to be sensitive indicators of the effectiveness of lessons and the abilities of individual children. We decided to devote most of our observation time to performance, particularly during the second semester.

Interaction

Interaction and performance were initially recorded on rather cumbersome "running records" in which all interaction between the teacher and children was recorded, either in a group or in the whole class. After some experience, we found that this technique could be simplified.

In general, teaching follows a pattern in which the teacher for the most part asks questions and sets tasks for the children. In our work, the task was almost invariably reading either words or sentences, "finding" a word in a list, or constructing sentences from word cards. The observer had time to write the stimulus item, identify the task (r for read, f for find) and note a given child's response. Correct responses were marked +. Incorrect responses were described.

Interaction data was mainly summarized in terms of the number of times each child was called on and the number of correct responses he made. Thus, the percentage correct could be calculated for each child. The form used can be found in Appendix A-5.

Performance

Oral reading performance was recorded on transcripts of books being read by the children. These were used almost from the beginning since our first attempts to record information without them proved grossly inadequate. The observer would note who read each sentence, and would describe on the transcript any deviation from the text and the teacher's response to it.

One intent of observing the type of correction was to determine how much information the child needed to correct an error -- if indeed he could do so at all.

In addition to noting errors and corrections, an effort was made toward the end of the year to time each child's reading. We found that it was quite possible for the observer to simultaneously record errors, operate a stop watch, and record reading times for each child's reading. We would recommend that in any future study of oral reading this be done from the beginning.

Results of these observations gave a surprisingly clear picture of a child's progress in acquiring reading skill; a schemata of this progress is presented in Chapter VIII.

Classroom - Written Work

Discrimination, reading, and correspondence worksheets were scored by the observer. Results were summarized in terms of percentage correct by individual and group. These results were used throughout the year to guide program decisions. Various uses of the data is discussed in the relevant chapters.

Chapter II

Coding Games

A Cognitive Approach to Reading Readiness

Do children understand that they can write what they say? And that others by looking at their writing can repeat what they originally said? In many reading programs the notion that writing is a code for speech and that letters are codes for sounds is never made explicit. The Coding Games Unit as an introduction to reading is an attempt to explain to the child that we communicate with symbols and to give him a rationale for the choice of symbols.

In learning to read, the child will be taught to decode letters into sounds that represent language. In this pre-reading unit, we try to show the child the reasonableness of the relationship between writing and speech. The unit begins with an emphasis on language and the various codes that can be used to stand for language. Then pictures and picture-symbols are used to introduce the child to written codes. Once the child learns to communicate with written symbols, the efficiency and use of the alphabetic code is introduced.

Background

Training on codes was the one single idea that generated the sustained interest and enthusiasm of all seminar members both in the initial stages during the first summer seminar and in the review and evaluation of the second summer.

The various try-outs of the Coding Unit included an informal presentation in September of the first year, a second more formal try out in two local kindergarten classrooms in the spring of the same year; a presentation to the two PL classrooms the following September; and use with two Harlem kindergartens in New York City the next spring. Most of the ideas that evolved during the first summer seminar remained intact during the various try outs, but the devices used, and the order and length of the lessons were revised, each time making the suggestions and instructions to the teacher more specific.

Summary of Suggestions of the First Seminar

A basic objective of the whole PL project was to avoid rote learning and instead to teach concepts in a meaningful way. The Coding Unit provided one means. We assumed that reading would be more meaningful to children if they understood the notion of code and correspondence, since reading is decoding print to language and the comprehension of that language.

Major Objectives

1. The Coding Unit emphasized the sequence of transmitting a message:
   encoding decoding understanding action

2. The Unit emphasized the necessary conditions for transmission of a message. That is:
   a. The sender and receiver must agree on the meaning of a symbol. By providing a variety of codes it will be possible for children to understand the notion of arbitrariness (or consensus) and realize that a code is of no use unless it is shared and understood.
   b. The receiver must follow the same pattern as the sender in order to get the message; letters or other symbols must be in a defined order.

Specific Objectives

1. There are different codes which can represent language. (gesture, sound, light, pictures, drawings, letters.)
2. To be meaningful, the symbols used in a code must be presented in a specified order.
3. To be useful, the meaning of the code symbols must be agreed on beforehand.
4. The code must be appropriate to the particular situation in which it is to be used. Visibility, audibility, and permanence are factors.
5. The most efficient and flexible code is that of letters to represent sounds in the language. One letter can stand for the same sound in many different words.

Incidental Benefits

Aside from the major purposes of the unit, there were some incidental benefits to the child. During these lessons, the child, probably for the first time, looked at language analytically. He had to think about ways of expressing ideas clearly so that others could understand him. When he was introduced to written notation, the child was forced to consider sentence order if he wanted to have what he "wrote" understood. The pre-reader was also introduced to the left-right orientation used in written English. In addition, the brief daily series of lessons provided an introduction to the more cognitively oriented routines of first grade.

The First Try-out: First Grade, September, the First Year

During the first summer seminar, suggested lessons were written introducing gestures to stand for a message. Sound, light, smoke, object, picture, and alphabetic codes were considered, as well. In practice, the Unit stressed two aspects: non-written codes (using gestures, sounds, and light as examples); and written codes (using pictures, stick-figure symbols, and letters).

In the first try-out, the Unit opened with a brief lesson demonstrating how a child can get others to stand for the flag salute by moving both arms in an upswing motion. Thereafter, the child who was to lead the flag salute used this gesture to get the children to stand, and its reverse to get them to sit afterwards.

During the Unit, the children worked in pairs preparing a coded message which they presented to the class. This technique was easy proof of the arbitrariness of codes since not many children could guess each other's code.

The teacher and students decided on written symbols to stand for objects around the room. At first a whole sentence was expressed with one symbol, then a phrase, then a noun plus determiner (e.g. the flag).

In one activity, the teacher prepared a treasure hunt using some of the symbols as markers (a symbol for flag, for example, or blackboard, door, or teacher's desk). The symbols were also used to give directions (a symbol stood for Go to another for the flag) or for games in which manipulation of three symbols could make a sentence like "Bring the book to the teacher's desk." or even so-called silly sentences like "Take the blackboard to the fishbowl."

Lastly, the alphabetic code was introduced by the teacher when: a) the overload of symbols caused memory strain, and b) new information was called for which the agreed upon symbols could not handle, e.g., How would you say: "Take the book from the teacher's desk." The point was made that a symbol for each word was clumsy and hard to remember, and besides, a simpler code was available. With a letter code one could use the same symbol every time one heard the same sound and this was easier to remember. The Coding Unit led directly into the Correspondence work of listening for sounds in words and identifying letters.

There was no formal evaluation of the lessons but the children enjoyed and seemed to learn from the activities. The lessons were, however, too "talky". We set about the task of writing more detailed presentations, trying at each point to include activities for the children that would be appropriate to their age and relevant to the point being made.

The Second Try-out: Kindergarten, Spring, the First Year

In the spring, the Coding Unit was tried out in two kindergartens in the Ithaca Public School System, one class taught by a staff member and one by the regular classroom teacher.

We will describe this try-out in detail, and then report only revisions in the lessons, and evaluation of the Unit for the later try-outs.

The Children

The classes can be described briefly as follows:

1. In the afternoon kindergarten the regular teacher taught the Coding Unit to 12 boys and 8 girls. The parents of most of the children were upper middle-class, and the children showed evidence of having had an enriched home background. They were interested in school, were very articulate and were aware of the expectations of the teacher. The teacher maintained firm but kind discipline.

2. In the morning kindergarten the PL staff member taught the Unit to a much larger group of children, 14 boys and 16 girls. The variability in their intellectual and social maturity was noticeable. The majority could be classified as coming from lower middle and middle class homes. As a whole, the class had low attention for group oriented tasks (individual children were allowed to wander at will) and discipline was difficult to maintain.

Lessons in both groups were observed each day by two members of the PL staff. (This practice was continued for each subsequent try-out.)

Content and Format

Content of the lessons is outlined in Figure 1. The first lesson can be summarized to show the added specificity of direction given in this try-out. The lesson began this way:

> The teacher says, "If you want Mary to know you went shopping yesterday, what do you do? You tell her -- you talk about it. That's one way we have of sending messages -- using our voices and speaking. Here's another way. Can you tell me what this means? (Teacher puts finger to lips -- elicits 'Be quiet'.) I could have said, 'Be quiet'. This (T. repeats gesture) stands for saying something."

During the course of the lesson the teacher takes the children through a number of common gestures, e.g., shaking the head for "yes" or "no", waving for "hello" etc. The children then demonstrate gestures they know. The lesson ends with a quick review. The teacher says:

> "One of the most important ways we have of sending messages to someone is by talking. What's another way of sending a message? How can you tell someone something without talking out loud? (Suggested prompts) When you want to speak to the class what do you do first? How can you tell the class to stand up without talking out loud?"

> Then the teacher summarizes the major point of the lesson:

> "Gestures may stand for a message. These hand signals stand for saying something."

This lesson took five minutes to teach. Most of the lessons took less than 15 minutes. When additional activities were planned, such as drawing pictures or writing messages, the teacher conducted them at a later time in the day.

The format for each lesson was similar. A review of the previous lesson was provided to be used at the teacher's discretion, the main body of the new lesson always included some child participation, there was a brief review in which children answered questions, and the teacher summarized the main point of the lesson.

The Coding Games Unit was completed by both groups in three and one half weeks.

Figure 1

Content of Coding Games Unit Before Revision

Day	Concept	Activities
1	"Stands for"	Gestures - whole class and individual activities.
2	Review "stands for"	Review previous gestures. Teacher puts several gestures together
	Order	(Order becomes important) Children follow message of gestures.
3	Arbitrariness of codes	Class decides on new meaning for light signal.
4		Teacher reviews "stand for". Teacher introduces word "code".
	Appropriateness of code medium	Children listen to Indian Drum record - sound code.
5	Different codes can stand for language	Children review ways of giving message. Children show ways for saying yes, no (gesture).
	Can have different codes for same language	Children devise new light and sound codes for same message (yes, no).
6	Review "stands for"	Children review previous codes. Children go from gestures, lights, and sounds for same message and compare with language.
	Appropriateness of code	Children decide which code medium can be used under restricted circumstances.
7	Language can be coded by written messages	Teacher gives examples of usefulness of written messages.
		Teacher introduces picture symbols. Children use to code how they feel (happy - sad).

Day	Concept	Activities
8	Permanence of written code	Children look at yesterday's picture codes to remember how they felt.
	History of picture writing, permanence of drawings	Teacher shows pictures of cave drawings. Reads from prepared script.
	Pictures can stand for words in a story	Children draw pictures to stand for telling about what they do before they come to school.
9	Need for agreement on code	Teacher and children look at a few previous day's pictures - discuss order and ease of reading code.
	Order for code	Use of picture code symbols in special order.
10	Picture-symbol code Agree on meaning and order	Teacher shows Indian trading picture. Children code own trades with pictures.
11	Permanence of written code	Recall previous day's trades - emphasize had to know order, and agree on what pictures meant.
	Distinction between picture writing and symbols	Compare difference between pictures and symbols. Children devise symbols for man and house.
12	Written symbols can stand for language	Teacher reviews symbols for man, house, and "go to". Children use symbols for messages.
13	Different kinds of written symbols stand for language	Teacher introduces trademarks, brands, and signs. Each child makes a symbol or picture to stand for his name.

Day	Concept	Activities
14	Written symbols can stand for names Use code to send messages	Children read messages teacher has written on flashcards and follow messages.
15	History of alphabet	Pictures of the progression from pictures which stood for words to letters which stood for sounds. Teacher reads from prepared script.
16 & 17	Review history of writing Efficiency of alphabetic code	Compare efficiency of picture symbols for names. Begin with children who have same or similar names.
18 & 19	Summary	Children demonstrate gesture, light, sound codes. Children read written codes that teacher puts on board. Compare all ways of saying yes-no without "talking" (gesture, light, sound, write yes, no).

Procedure

Both teachers followed the lesson plans closely, but some changes were made in approach and sequence to meet the needs of the two groups. For example, pacing in the morning kindergarten had to be high powered since the children were easily distracted. In one instance, two lessons were combined into one for the afternoon group, since additional work was not needed for this group.

Lessons were conducted with materials that were available in the classroom as standard equipment (drum, phonograph, crayons, pencils, paper, chalkboard). Other materials were prepared by the observers and the PL staff member teaching in the morning classroom (charts of trademarks, cattle brands, flannel board picture-symbol cut-outs, photographs of the children, written messages using children's trademarks, and other picture symbols).

The children in both groups had opportunities to devise codes using different modes and to use the mode appropriate to the situation to send messages to each other. They enjoyed those lessons that involved them in some activity - either group activities, such as playing a coding game, responding to questions; or individual tasks, such as making their own coding pictures or sending their own messages. We tried to exploit all possibilities for oral communication during these lessons.

Strengths and Weaknesses of the Lessons

In the afternoon class, the coding unit was begun the last week of April while the lessons in the morning group were begun two weeks later, the second week of May. By beginning the unit in one room earlier, we were able to make certain revisions in the lessons before presentation in the second room. For example, we found that use of slides to show cave drawings created many problems. First, the rooms could not be made dark enough. Second, it was difficult to maintain attention while discussing the slides. In the afternoon group, we had tried tape recording a script to accompany the slides. We discovered the presentation was too long, and did not allow the children to react to the slides as they were being presented. By the time the presentation was over, the children had lost interest in the lesson. Teacher explanation of the slides worked better.

Some of the concepts to be taught, and the means with which to teach them, were not made explicit enough for the teacher. An attempt was made to rectify this for the morning group by preparing more careful review and additional summary statements. The amount of review had to be adjusted to coincide with the needs of the group. The morning kindergarteners enjoyed the review activities - they were eager to demonstrate what they had learned the day before. Opportunities to engage in familiar activities seemed to be worthwhile for these children. On the other hand, the afternoon children were eager for new, challenging material, and were bored by review of concepts with which they were familiar.

During the teaching of the unit to the morning group, we included more message-sending activities. Use of children's symbols and familiar picture-symbols plus the abstract symbols used in previous lessons helped maintain high interest in this group. It also enabled us to use the sentence as the message unit. The teacher sent each child in the class his own message. In return, at least half the class sent messages to the teacher, their friends, and their families. We recognized the need for similar activities throughout the unit. The more children are able to use and expand work presented in lessons, the more likely it is that they will retain the salient concepts for future use.

In teaching a lesson using a simplified version of an Indian code for trading, we noticed that the morning children had trouble handling the complicated sentence structure as it was represented in the trade code. Instead of saying, *I have a teepee that I'll trade for a canoe*, these children were much more comfortable saying, *I'll trade a teepee for a canoe*. The way in which the picture symbols were arranged made only the first sentence the correct one. The resulting confusion about which picture represented the subject and which the object in the sentence suggests that the idea of spacial order would be better served by an example which could be put down in a Noun - Verb - Object sentence.

In both classrooms, the final lessons on the nature of the alphabetic code were not as effective as the preceding lessons. We found we needed to look closely at this important section. We had tried to clarify the difference between codes which stand for language (a sentence, phrase, or word), and the code which stands for the individual sounds in words. Even though our major purpose was *not* to teach the exact sound-letter correspondences but only to point out that they exist, some additional activities and examples were needed to get across the concept of an alphabetic code.

Evaluation

In each room, reactions of children were sampled by individual interview. (The questions and performance items used for each tryout are given in Appendix B.) The observers in each group conducted the testing. Each interview took approximately five minutes and the responses were tape recorded.

The Afternoon Group   In the afternoon group, 10 children (half the class) were tested. They represented a sample of the top, middle, and low scorers on Reading Readiness tests administered in April. The results showed certain strengths and weaknesses in the Unit. First the strengths: all children recalled at least two codes; 60% recalled all of the codes covered in the Unit. Almost all (90%) understood the notion of order in a message. There was good response to the idea of arbitrariness, that is, the children realized they would have to find out the meaning of the symbols before they could decode the message. Most showed evidence of having acquired new vocabulary; for example, they were using terms such as code, gesture, motion, or circular code with a flashlight in answering questions.

Now the weaknesses: less than half of the children could discriminate permanent from non-permanent codes. Furthermore, although almost all recognized the Apis (early pictorial ancestor of A) only one child related the picture to the symbol A, and when asked what a letter stood for, only one responded with "sound". Most of the children interviewed said the letter A stood for their own names. (We had used initials to stand for their names during the coding unit activities.) The lessons for the last two days of the Unit did not help to clarify the concept that letters stood for sounds in words.

The children in the afternoon group handled the gesture, sound, light, and picture codes effectively. They knew what a code was. The notion that codes can stand for language was emphasized throughout the unit. The group had no trouble with the notion of arbitrariness. They recognized the need to talk things over first and to find out what the code symbols stood for before they tried to decode a message. But we had not been successful in teaching that letters stand for sounds.

Data from daily observations showed that interest in the activities varied, but overall attention for the lessons was good. Interest was highest when the activity involved the children - they enjoyed "figuring out" new codes, making up their own codes, and writing down code messages, such as trades, and using a code to tell how they felt (happy or sad). They were very interested in reading type activities - and gave their full attention to the lesson on brands and trademarks. Some of the children were able to figure out the meaning for the various cattle brands.

This group also enjoyed using the coding vocabulary. They carried notions learned in the coding unit over to out of school activities ("I used a gesture last night"). The children related their own experiences and other pertinent information to the class discussions, ("The Indians also drew pictures to send messages"). This group of children was verbally oriented. Experience with the unit activities seemed to broaden their (already extensive) vocabularies.

The Morning Group   Of the 30 children in the morning group, 15 were interviewed. Since some changes were made in the curriculum for this group, the wording of the questions varied slightly from that used with the afternoon kindergarten.

Results indicated that the children knew a number of codes that can stand for language, concepts of permanence, and order, but arbitrariness of codes was not well understood. To be more specific: approximately 80% of the children mentioned gestures and sound codes as alternatives to talking, while 50% mentioned writing. Of the 15 children, 13 said that when the person to whom they wished to send a message was absent, they would communicate by letters or pictures. Almost 80% were able to form a sentence using picture symbols, putting each in the right order. (We had emphasized this activity in this classroom and children had spontaneously sent messages to each other in their free time.) Further, it was found that 60% could read a silly message; they could say the words for which the symbols stood, even though the message made no sense. On the negative side, these kindergarteners didn't respond well to the question on arbitrariness (If we sent this code that you just made up to your teacher, would she know what it said?), and no one could answer the question: What does a letter stand for?

The children in the morning group responded enthusiastically to this unit, often applauding the visiting teacher. With a few exceptions their eagerness and readiness to learn was obvious. The data from the interviews affirms our general impressions. Lessons where the objectives were clear, when there was no confusion in the use of terms and when the activity in the lesson was directly related to the objective (not a frill), were by far the most effective. In contrast to the afternoon group, these children preferred "to do" rather than "to discuss". They performed readily using the various codes (gesture, sound, light). As was noted earlier, they particularly enjoyed using the picture code to send messages, and would continue a coding activity of that day in their free time.

Summaries at the end of the lesson had to be carefully structured with questions that we hoped would promote discussion. In most cases the children answered "yes" or "no" (this same lack of verbal facility was evident in their other oral activities, we observed, such as "Show and Tell"). Only a few children could generalize from specific examples. In most cases, the concepts had to be summarized first by the teacher.

We did not notice children using the coding vocabulary spontaneously as did the afternoon group, even though the regular teacher said she used the terms code, signal, symbol as often as she could. (This difference between the two groups was of some concern to us but evidence from a later try-out suggests that the apparent lack of increased vocabulary was idiosyncratic to this group.)

For both morning and afternoon groups the coding unit was scheduled each day after a Show and Tell period. After sitting approximately 15 minutes (or more) for Show and Tell, an additional 15 minutes spent with the coding activities exhausted the children's capacity to attend. Free play time followed and this was a very desirable activity. Occasionally, however, the teacher of the morning group scheduled the coding work first, just after attendance had been completed. The observer and the PL staff member teaching the unit noticed a marked difference in the children's behavior. They were alert and able to attend for a longer period of time than they usually did. The children were "fresh" and this seemed to be the perfect time for cognitive activities.

The Third Try-out: First Grade, Sept., the Second Year

Between the second and the third try-outs, the summer seminar intervened. One sub-group worked on revisions of the unit during the seminar, and the revised Unit was presented to the two PL first grades in September.

In order to concentrate more on the important last steps, several activities were dropped. Those omitted included looking at pictures of cave drawings, making up a picture to tell a story, the discussion of trade-marks, and the presentation of the historical evolution of letters from pictures. Except for the Indian trading sentence which had inherent difficulties, any of these lessons could be re-included if time permitted in a particular classroom. But each of the omitted lessons can be considered as supplementary rather than essential.

The revised Unit added two more lessons bringing the total number of lessons to 21. The lessons after Day 12 dealt with some form of letter-sound relationships and included sections on correct orientations of symbols to a line - both pictures and letters. From the point where written codes were introduced, we devised symbols for single verbs and nouns (not 3 word phrases or full sentences represented by one symbol).

The Circumstances

We had agreed that the Coding Games were most appropriate to kindergarteners but felt we could get feed-back from watching our PL first graders react to some of the newly added material.

About half the children in the suburban school had attended the afternoon kindergarten the previous Spring when the earlier version of the Unit was taught. Therefore, Coding lessons in this first grade room were compressed and many of the activities omitted.

In the rural classroom, lessons were spread out over many days. The rural classroom teacher decided that in the future she would teach the Unit in a shorter period of time, giving daily practice. Both teachers agreed that the Unit lost its force once "real" reading started in the classroom.

The Results

Suburban School In the suburban school, 22 children were interviewed. On the positive side, the children could put symbols in the right order; they could remember a number of non-verbal ways to send messages; and almost two-thirds (63%) were able to tell when a single written symbol stood for more than one word, e.g., = the flag.

But just as in the previous try-out, we had not done a good enough job teaching these children about the arbitrariness of codes. For example, all were aware that a familiar symbol would be known by classmates, but only half (54%) said that others would *not* know the meaning of an unfamiliar symbol. Even fewer (9 children) would admit that a symbol they constructed themselves would be unfamiliar to others. (We may have been fighting a Piagetian egocentrism here, and if so, probably an impossible battle.)

New questions on letters as codes had been added. All 22 children identified the letter *s* by name; 18 (81%) could give the sound (What's the same about *sir*, *sat*? What sound is the same?); 19 could choose an *s* word from a pair (*sod*, *mine*). By the time of the interview, quite a few of these children were doing some simple reading and had begun the correspondence program. The added practice surely influenced these answers.

Rural School Eleven students were interviewed. These children knew what a code was, had a working knowledge of permanent vs. non-permanent messages, and understood the arbitrariness of codes better than their suburban peers. They did fairly well on the sound-letter correspondence questions, but could not tell when a picture symbol stood for more than one word, nor could they put a set of symbols in order to make a message. Specifically, of the 11, 8 (72%) could remember a number of non-verbal ways to send messages, and when prompted (Remember Red Fox?) all could give at least one method of communicating. The same 8 students understood the difference between a permanent and a non-permanent message; again, with prompting, (Could you use a drum, etc. ?) all answered appropriately. Most of them had a clear notion of arbitrariness: when shown a familiar symbol 91% answered correctly, when shown an unfamiliar symbol, 72% did.

In questions on sound-letter correspondence, all identified the letter s by name, 7 (64%) could tell the sound, and 8 (72%) could pick an s word from a pair. None of these children could not tell when a picture symbol stood for more than one word, and very few (4) could put in order a set of symbols to make a message.

Summary

The responses of the children in both classrooms to the sound-letter correspondence questions indicated a better understanding of this relationship than had occurred in the previous try-out and this was the section which had been weakest before. The interviews showed, however, that the children were not aware of separate words in an utterance, or that more than one word was sometimes represented by a single symbol.*

In preparing the Unit for our out-of-town try-out, we omitted any symbols which stood for more than one word, prepared blank cards for use between symbols (of words) when messages were being constructed, and introduced two rhyming patterns (sad-glad, etc. and cat-hat). Otherwise, the Unit remained the same. The content of the Unit as revised for the fourth and last try-out is presented in Appendix B.

The Fourth Try-out: Kindergarten, Spring, the Second Year

The Circumstances

Two urban kindergartens in Manhattan were chosen. A faculty member of the City College of New York who had attended both summer seminars acted as liason and made arrangements for two students at the College to observe the lessons and conduct interviews with the children afterward. A member of the PL staff held two orientation meetings with the teachers and observers prior to the try-out, and also observed a lesson in each classroom about half-way through the Unit. Essentially, however, the Unit was considered a package which should stand alone by now and as such was largely left to survive or fall on its own merits.

Lessons were given three times a week to accomodate the observers' schedules.

There were 40 children in all in the two classrooms, with a 6 to 4 ratio of boys to girls; 22% were native Spanish speakers.

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*Other data "The boundaries of written words as seen by first graders" Meltzer and Herse, Mimeo, 1966, support these findings.

The Results

At the end of the Unit, the observers interviewed individual students. Seven students who had been absent for 7 or more lessons are not included in the results presented here, and data for 6 other children was lost because of a tape recorder failure; 27 students, therefore, were interviewed.

When the Manhattan teachers were asked to rate the children, they rated 63% as having learned the concepts, 25% as having learned some concepts, and 12% as not having learned the concepts. It is interesting that these figures are comparable to those given below.

1. Questioned on possible modes of communication, 89% gave at least one mode - 96% of the English speaking children and 80% of the Spanish speaking children.

2. Questioned on appropriate mode to use when decoder is out of sight and hearing, 42% answered appropriately, 52% of the English speakers and 23% of the Spanish speakers.

3. Questioned on arbitrariness ("Will X know what this means?" referring to a symbol the child had just constructed), 54% answered correctly, 53% of the English speakers and 55% of the Spanish speakers.

4. Requested to arrange symbols to form a message, 61% arranged the cards in an appropriate left-to-right order, 65% of the English speakers and 50% of the Spanish speakers.

5. The sound-letter correspondence questions were revised to test understandings taught in this presentation that had not been stressed before.

    a. The child was asked to tell the first letter of his name; 79% could do this. Of the 79%, 56% could give another word beginning with the same letter as his name.

    b. After being asked to give a word to rhyme with sad, 78% could visually pick out what was the same in sad and their rhyme when it was written for them, but only 24% could tell what part they heard that was the same. (They simply said, "They're the same." Obviously a poorly worded question.)

6. Of the new questions added:

    a. 65% of the English speakers and 50% of the Spanish speakers could place symbols in correct orientation to a line.

b. 52% of the English speakers and 30% of the Spanish speakers could use space marker cards to mark word boundaries.

c. And in a word circling task added to get data on another project, (E. shows a sentence: "Can you draw a circle around one of these words? Now another word? Draw a circle around each word.") of the 33 children tested - 06% circled none, or circled incorrectly; 24% circled letters; 57% circled some words (ranging from 20% to 99% of the words); 13% circled all words correctly.

Teachers' Evaluation of the Unit

The two Manhattan teachers found many positive aspects in the Coding Games and both are currently using the Unit. While each made a number of suggestions about details of individual lessons, they felt the Unit to be a valuable addition to the kindergarten program. Specifically, they reported that children knew they were learning something and were pleased about it -- they looked forward to having "lessons" (whether or not one agrees with Bereiter (1966), there may be positive value in a structured attempt to stretch the mind a little at this age); and that the children liked and used the new vocabulary (we had been worried when this didn't happen during a previous try-out). The use of symbols, these teachers felt, was of particular value to the Spanish speaking children, a value the PL staff had not previously considered.

The earlier kindergarten try-out used one teacher from the PL staff. In the 'morning' kindergarten where the staff member taught and the teacher looked on, the teacher was most enthusiastic, even to the point of suggesting additional games, one of which is now included in the Unit as optional. This teacher asked for and received a revised copy of the Unit and was planning to let her student teacher use it this year. The other kindergarten teacher - in the suburban school - although most cooperative and helpful during the try-out, expressed no interest in integrating the Coding Games into her regular program.

As for the PL first grades, the same difference holds. The suburban teacher felt (as we did) that the Unit was geared for kindergarten, and, although the activities were well received in her class, she expressed no interest in continuing their use when on her own. Conversely, the rural teacher, whose class came to her with fewer skills, liked the orientation to tasks which the Unit provided and liked the use of children's initials as a first step toward sound-letter correspondences. She felt that "What is a word?" was not hit hard enough (the one substantive addition to the program in the later

Manhattan try-out was more emphasis on this point), and that the Unit should be completed first before going on to other aspects of the reading curriculum. This teacher is planning to use the Coding Games again.

So, in general, the first grade teacher and the three kindergarten teachers who taught the children in poorer neighborhoods were far more enthusiastic about the benefits from the Unit than the two teachers with higher SES children, some of whom were already reading at the time of the unit's presentation.

Conclusions

The responses of the children to the interview questions should be accepted with caution for the following reasons. The wording of some of the interview questions did not always tap actual learning, we felt; the interviewers were very briefly trained; the interviewees were often ill at ease when for the first time they were questioned individually and their responses taped.

Nevertheless, the responses can be plotted to give some indication of learning. Figure II presents the concepts that were introduced; the number of correct responses to questions concerning these concepts are given in terms of pluses and minuses.

The Unit seemed to be successful in teaching many of the children that

a. there are a number of codes that stand for language
b. written codes are more permanent than non-written
c. the order in which a message is sent is important
d. both the sender and the receiver of the message must agree beforehand on the meaning of the coding units
e. when revised versions stressed the relationship of letters to sounds, and the necessity for correct orientation of a letter to a line, these understandings also improved.

Figure II

Correct Interview Responses

Concepts	Ithaca Kindergarten A.M.	Ithaca Kindergarten P.M.	Ithaca First Grade R.	Ithaca First Grade Surb.	Manhattan Kindergarten Eng.	Manhattan Kindergarten Span.
What is code; kinds	++	++	++	++	++	++
Order in a message	++	++	-	++	+	+
Permanent vs. nonpermanent	++	-	++	++	+	-
Arbitrariness of codes	-	++	+	-	+	+
Sound-letter codes	-	-	++	++	+	+
Separate words in utterance	d.a.	d.a.	-	+	+	-
Correct orientation to line	d.a.	d.a.	d.a.	d.a.	+	+

Correct Response	Symbol
75% - 100%	++
50% - 74%	+
49% - 0%	-
doesn't apply	d.a.

Recommendations

It is our feeling that the major goals of the Unit were understood in a rather superficial way by the children and that some of the "fun" lessons, e.g., the slides of the cave drawings, or the presentation of the evolution of letters, could be taught more advantageously and with more serious purpose to 9 or 10 years olds. The Unit could thus be begun in kindergarten where it has demonstrated its usefulness as pre-reading and general language arts training, and with the addition of further lessons be pursued later as a study of written language in a far more sophisticated way than was possible with 5 and 6 year olds.

The Unit would still be useful in a first grade for those students who need to have a great deal of help on initial perceptual reading skills. Work on coding games at the same time would add a dimension to their preparation. The Unit could be followed by a version of the 'high risk' reading program discussed in Chapter III.

Whether the Unit is used in kindergarten or first grade, provisions must be made to refer back to the concepts in the Unit at a later time during the year.

Chapter III

The Reading Program

This chapter discusses the materials used in the reading program and the progress of the children at various points during the year. The tests administered in the fall and during the year are described in some detail in the section on content. This section also includes a description of the introductory sentences, the staff-produced materials, and our rationale for the choice of commercial texts and trade books. The next section tells about administration of the program and the progress of the children. It includes descriptions of the small groups, pacing of lessons, and special sub-routines to take care of individual problems. Finally, in the last section, the evaluation procedures used in June are reported and analyzed.

Part I - Content

Pre-testing

During the first year's try-out, several tests were given in September. The school administered a standardized readiness test to all first graders to which we added several others. Results of these tests are reported elsewhere.* Here it is sufficient to say that in general the tests indicated that the class was ready to read. The few differences that existed, we felt, could best be handled in the reading and phonics program, not in a prolonged pre-reading program.

During the second year's try-out many of the same tests were used but some were added and some were revised. The tests are described below and the results are reported for each classroom. Many of these tests could be given by the classroom teacher during the first few weeks of school since the time involved per child was about 5 to 10 minutes for the individual tests, and some of the tests were given to the class as a whole. We learned a great deal about the children's specific strengths and weaknesses from the tests and felt we saved ourselves and the children learning time by their use.

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*Robinson, First Grade Report, 1965-1966, ERIC

Description of the Tests

An * indicates tests given only the second year. Tests were devised by the staff unless otherwise noted.

1. *Clappy*. An informal test administered individually to discover which first graders could already read a few common words. In using this test in the second year we added questions which would tell us if a child could distinguish separate words in connected text and distinguish separate letters in a word. The materials consisted of a large poster of a clown holding balloons. On the balloons were written the words: *dog*, *happy*, *hat*, *shoes*, *now*, *fat*. Underneath the picture were two sentences: *My name is Clappy*. *I am a clown*. If the child could read the individual words and the two sentences, he was given a separate story consisting of six short sentences about the clown. A further probe was added the second year asking for *any* words the child knew how to read. If he didn't supply his own name, it was written and he was asked what this word said.

2. *Reading Readiness*. The school system administered the New York State Readiness Test, a group test, which included six subtests: word meaning, listening, matching, alphabet, numbers, copying.

3. *Visual Discrimination*.
   a. In the Durrell (1956) letter matching test, the child must circle the one letter (out of four) which matches the letter held up by the teacher. We tested lower case letters only.

   b. A word matching test taken from Continental Press materials is meant to determine whether the student can tell which of four words matches the stimulus word on the left of his paper. Twelve lines of words are presented, four in each of the following categories: gross differences from the stimulus, only initial consonant differences, only final consonant differences.

4. *Letter Naming*. A cardboard wheel was constructed exposing four lower case letters at a time. They were arranged so that letters children seem to know best (based on findings from Durrell, Popp 1966) were presented first. All students saw the lower case letters. A second wheel containing capital letters was prepared but only those capitals were presented whose lower case forms were known.

5. *Auditory Discrimination*. This test was administered individually during the second month of school. Our experience (confirming

deHirsch 1966, Wepman 1963 and others) is that the child needs much practice before results of this sort of test can be considered valid. The child answered "same" or "different" when he heard a pair of words pronounced. Probable minimal and maximal contrast of consonants was worked out using a distinctive features matrix (Halle 1963). Minimal pairs differing only in initial position were used as the auditory stimulus (e.g. "vat - fat").

*6. Syntactic and Semantic Anomolies. Sentences were read to each child individually containing either semantic anomolies, e.g., "a black sun", or syntactic anomolies, e.g., "Him were going". The child decided whether he would ever say such a thing and decided whether the sentence was "silly" or "O.K.".

*7. Semantic Judgments. Given an incomplete sentence, the student supplied a word or phrase to complete the idea (verb, color word, etc.).

*8. Expectations About Reading.
   a. An informal inventory was administered individually to discover what ideas children might have about the uses of reading; e.g., whether they think of the picture as essential to a book, whether letters and numbers can be discriminated from each other or from pictures and abstract symbols.

   b. During class time the teacher asked the class what they expected to learn or do in first grade.

9. Other. The vocabulary test from the Stanford-Binet (Form L-M 1960) was administered to all children the first year. This was not repeated the second year. The complete Binet, however, was given to all children in the rural school during the course of the second year. Several children in the rural school were also given the Frostig Test of Perceptual Abilities (1963). It was not thought necessary to give this special test to all children.

Results

For the exact results see Appendix C-1. Our conclusions from the various tests were these:

1. Clappy the Clown (Ability to read) Most suburban children would be wasting time on reading readiness but most rural children needed lots of exposure to print. Only one rural child could visually identify a word.

2. *Letter-naming, lower case* Most suburban and all rural children needed work in learning letter-names. Five children in the rural school responded with numbers to some of the letters, for example: s/5 or t/4. Some children in both classes responded with the number *one* to the letters *l* and *i*. The best known letters were *o*, *s*, *x*, *j* in both classes; the least known were *q*, *h*, *u*, *n*, *d*, *v*, *g*. Appendix C-1 gives exact data. A test of this sort is particularly important to use if the teacher wants to teach letter names early in the year.

3. *Letter-matching, lower case* The types of errors were as expected (*d* for *b* and *p* for *d* being the most frequent confusions) but there were too many errors in the rural class not to give specific training.

4. *Word-matching* This test was not particularly helpful in discovering specific problems that hadn't already shown up elsewhere. It is, however, one more indicator, added to others, that discrimination problems exist for specific children. Fewest errors were made when there were gross differences between choices, next when only the initial letter differed, and most errors occurred when only the final letter differed from the stimulus word.

5. *New York State Readiness Test* In the suburban school 23 students were tested. The total scores produced a mean percentile rank of 92.5 and a range of 63 to 99+. In the rural school 19 students were tested (one was absent). The total scores produced a mean of 38.5 and a range of 14 to 86. This test provides letter grades for each range of scores. These grades carry norms such as "Low Normal", or "Superior". These scores and their normative ratings serve as points of reference but are not specific enough to be diagnostically helpful in planning work for individual children or groups. For example, what does the "Low Normal" child not know that the "High Normal" child does, and how does that knowledge or skill contribute to later reading achievement? In the suburban school, the one boy who later had the most trouble learning to read (granted, an emotional problem was involved), scored 91 on this test; the other 3 boys in his subseqent reading group scored 91, 69, 57.

   In the rural school, however, the readiness test roughly predicted reading group membership. The mean score of each reading group from Group I to IV was 50, 45, 29, and 30 respectively, but high and low scores within each group would preclude using the test results ahead of time for grouping purposes.

6. *Syntactic anomolies* Quite a few children in both classes accepted "runned" as correct. In the rural class, "They having are dinner". "The boy talked the girl". "The boy was hit the girl". were accepted as correct by a large percentage of the students. The fact that children may have heard the examiner say, "They having *our* dinner" changes the problem in this sentence from word-order to a missing auxiliary verb. The other two sentences also have missing words (talked *to* and hit *by*). This suggests that function words were not salient cues to these children. Pronoun case (Them are ___) and number in verb (girl am ___) were also accepted by almost half the rural children. One may conclude that some of the rural students were not secure in their knowledge of well formed sentences in the standard dialect.

7. *Semantic anomolies* In both classes, there was wide acceptance of opposites as equal (A *little* of something is a *lot*). In the rural class, a large number accepted *hot* and *cold* as equal, too. Many of the rural children found nothing strange in a black sun, or an eight year old father. In all, the suburban children had an error rate of 05%, and the rural class of 24%. The errors may have been the result of lack of familiarity with language tasks or games, or a real lack of understanding of the concepts involved.

8. *Semantic judgments* The suburban class made no errors, the rural class made 10 errors. Comment on Test 6, 7, 8: The semantic and syntactic tests give a rough indication of the child's facility with language. There was no extra work needed in the suburban class, but the rural children had problems -- either in test-taking, or oral language in the standard dialect, or both.

9. *Auditory discrimination* (given in November) The suburban students made 6 errors in all; the rural students made 22. Most of the errors came in reporting two different words as the same.

10. *Expectations about reading*
    a. This test is in the pilot stage;* so far it has discriminated pre-school students very well, but was of less use in our situation. The test, however, was given 6 or 7 days after the *Clappy* test; in that space of time, all rural children had learned enough about letters and numbers to sort them into different piles.

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*Herse, Robert

b. In response to teacher's question, "What are you going to do in First Grade?", three-fourths of suburban class volunteered answers. Responses were all related to tasks: reading, writing, numbers, etc.

The same question in the rural class was met with silence. As a prompt, the teacher asked what had happened in kindergarten, and several children mentioned games and playing. Finally, one boy said facetiously that this year he was "going to fight with Jimmy". The teacher then explained some first grade tasks.

11. Other

a. Stanford-Binet: given in the rural school. The range of I.Q.'s was from 70 to 120 and distributed as follows:

70 - 86	6 students
90 - 97	5 students
100 - 106	4 students
113 - 125	4 students

b. Three of the rural children whose I.Q. scores were average or above but who weren't performing well on reading tasks were given the Frostig Test of Visual Perception. This test includes sub-parts dealing with figure-ground, constancy of shape, and spacial relationships. The children received a "Perceptual Quotient" of 110, 104, and 100; presumably ruling out any gross visual perceptual disability on their part.

Conclusions

Except for letter naming and some work in auditory-visual discrimination, the suburban children did not need work in readiness. The two types of lessons just cited could go on during the initial introduction to reading where necessary.

Many of the rural children showed deficiencies in each of the tests. Each child's individual profile was plotted, examined, and the early attempts at grouping were based in large measure on what skills could be taught to several children together. Since the rural children were lacking in so many perceptual and language abilities, we decided to concentrate on these and move very slowly into the reading program. We wanted them to really succeed in the tasks they were given whether this meant they would read at a given level in June or not.

Content: Initial Period

Reading materials were chosen from many sources. We used children's own stories, teacher's sentences, trade books, text books, messages from one child to another, bulletin board titles, worksheets, riddles, crossword puzzles, and stories composed by our staff. We did this because we felt that a literate person reads everything from bill-boards to Proust and automatic responses to the printed word as communication should be built in early. Our second reason was to allow a variety of cues to be present in the reading matter. If a narrow range of reading matter was presented, words pre-taught, length and structure controlled, we felt the child would not be allowed the full range of sampling necessary to be a reader in any real sense during his first year of instruction. But we did learn to structure the presentation of these materials. The initial introduction to reading is a case in point.

Initial Materials

Initial teaching had as its content student-produced stories, teacher-composed sentences and nursery rhymes.

Attempts were made the first year to transfer early correspondence skills to the reading materials by means of the group-composed stories. For example, one group-produced story included the sentence, "We have two toads", and this reinforced phonics lessons dealing with the sound-letter correspondence of t. Unfortunately, too few of the reading sentences included letter-sound combinations to match the phonics sequence, and even when they did occur they could not provide sufficient or varied enough practice by themselves. During the initial period of the second year, we did not attempt to introduce reading via student-produced stories, although later in the year, we did occasionally make use of this strategy. Instead, the number of teacher-composed sentences, which had been more successful as an introduction to reading, was increased during the second year.

To give a more exact idea of content, the reading lessons for the first four weeks of the second try-out are presentedbelow in parallel columns for each of the classrooms.

In looking at these lessons, note the make-up of the teacher composed sentences. The use of common words, possibility of permutation which allows both teacher and student to createnew sentences, including "silly" sentences that provide a check on compehension, the repetition from one sentence to another; and use ofthis technique to help the teacher get to know her children's strenths and weaknesses were all taken into account in the selection of these sentences. Note also that for some children the pre-book period is a very short one.

The first text used during both years in the suburban school was Ladybird Book 1a followed by Book 1b. These books contained a 16 word vocabulary which was introduced in 1a and repeated in 1b. Both suburban and rural classrooms were next introduced to the six Chandler booklets containing a 67 word vocabulary.

Week One

Suburban
Teacher Composed Sentences

My name is Mrs. Cushman.
What is your name?
Mrs. Cushman is my name.
My name is ___ (child's name)
Today is Monday. (Tues., etc.)
Is today ___? (day)
Is this ___? (day)
How many are here today?
This is ___. (child's name)
Make 2 ___. (picture)

Rural
Teacher Composed Sentences

My name is Mrs. Dyer.
Mrs. Dyer is my name.
My name is ___. (child's name)

Today is Monday. (Tues., etc.)

This is red. (individual cards prepared for matching games.)

Nursery Rhyme

Jack and Jill on chart paper: used for rhyming, pointing to particular words and letter; left-to-right orientation of print.

Week Two

Suburban

Review from week one.

New Sentences

____ is here today.
How many are here today?
Here is a ___ (picture).
This is yellow.
Is today red?
Look at ___ (symbol picture).
Look at ___(name).
Look at me.
I will look at you.
Go to your ___ (symbol for desk).
(Go to and Look at were first introduced in Coding Unit.)

Small groups begin to work with sentences, words, letter-naming.

Small Groups

Mon.
Small groups work on auditory-visual discrimination.

Tues.
Three boys read Ladybird 1a, 1b, one made no errors; the other two made one or two errors some of which were self-corrected. Both teacher and observer thought the session very successful.

Wed.
Review color words, sentences.

Thurs.
Three groups met teacher for review.

Fri.
Two groups met teacher for letter-naming and sentence review. Ladybird group chose someone to read story to.

Rural

Review from week one.
Word cards used. Teacher scrambles words; students rearrange and read.

New Sentences.

This is red.
This is green.

Small Groups

Review teacher-composed sentences.
Rearrange word cards into sentences.
Identify & point to individual words in sentences.
Listen for words that start with "s" sound. Match & identify by name the letters i, a, s.
Letter naming.

Week Three

Suburban	Rural
Reviewed *d*, *s*, *a* from full group correspondence lessons. Group I read *Ladybird 1b* Group II read *Ladybird 1a, 1b* Group III reviewed teacher-composed sentences	Group I, II reviewed: Mrs. Dyer is my name. My name is Mrs. Dyer. All Groups: rhymes-visual and auditory discrimination, counting letters and word sound of "s" Letter-naming: A-E and Z F-J and Y

Week Four

Group I finished *Swings*; read *Slides* to p. 15. Group II reviewed *Ladybird*; read *Swings* to p. 7. Group III reviewed sentences; read *Ladybird 1a* to p. 28.	Group I new sentences in preparation for first Changler book *Swings* plus: Here is Mrs. Dyer. Here is ___ (symbol). I am ___(symbol for happy). Groups I, II, III practice in letter naming from A-J Group IV letter naming A, B, D. All Groups: listen for *s*, *d*, *m* sounds in initial position.

Differences in the Two Classrooms

The teacher-composed sentences were reviewed over and over in the rural classroom, while the suburban youngsters quickly went on to the *Ladybird* and the first two Chandler books: *Swings* and *Slides*. Note that the rural teacher, Mrs. D., is still working on color words at the end of four weeks (and will continue to do so during the next period). She had to teach the recognition of colors as well as the association of the written word with the correct color.

Practice in learning the names of the letters took up far more time in the rural classroom than the suburban. It seemed to be hard for the rural children to attach a name to a particular shape. The range went the full gambit from not knowing any of the alphabet names, through being able to say the names and attaching them to any written letter (or number), to actually knowing and identifying some letters correctly and not knowing others but being aware of them.

In both classrooms during the first week, some children were not able to point to the separate words in a sentence being read to them. At the end of four weeks, several rural children were still confused about the difference between words and letters in a visual display, and also needed practice in dividing a spoken phrase into its component words. The Michigan listening program was initiated for whole class work in the rural class. In its initial stages, this program gives the teacher a set of words to say, e.g. "White house, house white", and the children decide if she is saying the same thing twice or if it is different the second time.

The rural children also didn't know what the task of matching one thing to another meant or how to go about it; they didn't know left from right, and couldn't visually discriminate similar forms. A third workbook in the Michigan Program consisted of visual matching of a letter or string of letters to a sample. Selected pages of this workbook were used as well.

The rural children had great difficulty following directions of any sort. Their problem in understanding the task at hand became evident early in the school year. Once a particular set of instructions had been understood - sometimes a matter of three or four lessons -- any variations in the task caused confusion again. For example, from our staff report at the end of September comes the statement: "It has been necessary for the teacher to re-explain the matching task daily since when some of the students [i.e., those who had made no mistakes the day before] are allowed to go on without this review they begin to make errors." The children desperately needed help in learning how to learn. One of the assets of good programmed materials for first grade is a simple structure and clear directions. We hoped the teacher directed use of the Michigan and later the Sullivan programs would help eliminate the frustration these children were feeling in trying to cope with too many cognitive tasks at once.

Formation of Reading Groups

Whole class teaching was combined with heterogeneous small groups at first. During both years the same procedure was followed. Small groups in each class met almost from the beginning. The use of techer-composed sentences allowed a heterogeneous arrangement with a gradual grouping together of children who could learn at the same rate and who needed practice in the same skills. Reading groups were not labeled but children were called by name to join the teacher. Later, when groups became more stable, John's group, or Mary's group was asked to join the teacher. The teacher used different children's names to identify a group each day. Homogeneous reading groups were established after an initial trial period of working with groups of about five children each day and rotating a child from one group to another until it seemed that certain children who could learn at the same pace were more and more appearing in the same group. A tentative top group was formed on the basis of the test results which revealed certain strengths, plus the positive responses and good memory displayed by these children in the early whole class and small group lessons. Gradually, in the next few weeks, others joined this group. Group membership continued to change from day to day in the early period as it was found that individuals needed more or less review, a slower or faster approach, or needed special drill in sound-letter correspondences, letter names, or other preliminary skills. The observer's records of responses and errors in reading sessions were a major consideration in deciding group membership, as was the child's ability to attend.

Independent Work

It must be that most first grade teachers do not work with small groups early in the school year. Our teachers were constantly running out of ways to keep other students profitably busy while they were working with a small group. Several games were introduced, since the written assignments were finished very quickly. Although we did not solve the problem of always keeping six year olds profitably busy on their own during the initial period, at least our experience showed that one can survive this rather brief phase.

Informal Testing

Beginning in November of both years each child read a passage into the tape recorder. The first year, two passages were read each month beginning in January, one was an old reading-group passage, and one was a new previously unseen passage. New passages of one month tended to become old passages the next. We kept a record of the number of errors, type of correction, and the total time of the reading for each child. During the second year, children also read a passage which was taped, transcribed and analyzed. These staff-prepared passages varied in difficulty and allowed comparison between different groups of children, something we had found difficult to do the first year. Under the Evaluation section in this chapter findings from these taped readings are discussed, as well as results from other measures. Other informal testing is reported as it occurred during the year. For example, in October several informal evaluative and diagnostic checks were made in both schools.

Suburban On October 11, Reading Group I in the suburban school was asked to read a passage of 29 different words. These children learned to read very well by June. Here is how they were doing after one month of school reading familiar words in a new context.

The 20 words where errors occurred appeared in the text 33 different times. There were 98 errors in all or 63% correct on the average for the group. Most students (45 - 75% of the Ss) made errors on eight of the words: shop, has, see, today, this, push, blue, toy. No errors occurred for Jan, is, like, will, go, me, red, I, we.

If those words occurring more than once were considered correct when correctly read the second or third time, there were 66 errors, or 72% correct.

Rural Two dittoes were given to test knowledge of vocabulary in teacher-composed sentences. Both were multiple choice.

a. The first was given on October 13. It contained three sentences.

4 students made no errors
1 student made 1 error
10 students made 2 errors
1 student made 3 errors.

Students who made errors seemed to be attempting to match a word in the sentence rather than trying to complete the sentence. For example, in the sentence,

My name is Mrs. ____. Dyer
name
red

there were 11 wrong choices, most of them being the word name.

b. The second ditto was given on October 24.

Sentences:	Choices:	Results:
1. My ___ is Sam.	this	16 students made no errors.
2. ___ is red.	is	1 student got 2 wrong.
3. Sam is ___ name.	name	1 student got 3 wrong.
4. This ___ green.	my	2 students got all 4 wrong.

Materials After The Initial Period

Read-alongs

The practice of introducing trade-books to students so that they could follow along in the text as the teacher read, and gradually try to read parts of the text themselves, was begun as a way to solve a particular problem. We had looked for texts in which the language was non-stilted. We wanted stories, for example, where contractions were used when contractions seemed natural, and where a variety of sentence structures occurred to give the text a certain literary style. We also looked for a good story line. We found very little material of this sort at the beginning reading level.

The hard-cover texts that we did like could not be presented immediately after the first book, (Ladybird or Chandler) because they all contained too heavy a vocabulary load and couldn't be used until the children had more power to attack words independently and had built up a few more automatic responses to frequent words. We had to look for ways to bridge the gap. One way was to find trade books which the children could read along with the teacher.

Lessons were planned to allow the children to read selected words and phrases after listening to the teacher read the page. This method is very like Robert Allen's Read Along With Me technique but not so rigidly controlled. We tried it out the first year using a trade book called Little Tiger Learns His ABCs in which cues are abundant. Each page in the book is devoted to one letter and a picture cue is available. We used this occasion to test, a) the children's ability to match upper and lower case letters, and, b) ability to find words beginning with the same sound within a sentence. Much to our surprise, the children were also able to "read" all of the sentences. To give an example "He cruised on a crocodile, and that was C.", "He insisted on ice-cream and that was I." Gratified by the response, we followed this story with others from time to time during the year, sometimes taping the stories as well, so that children could listen and read as often as they wanted. The Little Tiger book was followed by a simple story called Cats, Cats, Cats. The Cats books introduced useful words such as big, little, fat, thin with a picture of an appropriate looking cat to illustrate each adjective. (We only had one copy of this book available but the text had large print and the teacher held the book so all could see it. So, if a teacher has only one copy of a trade book that she thinks her class would enjoy as a read-along this need not keep her from using it.)

During the second year's try-out, Little Tiger was again used as the first read-along. In the rural school, the Chandler booklets were also introduced first as read-alongs as more and more children

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were able to move from mainly pre-reading to reading activities. For example, the first Chandler book, Swings, was read over again for different purposes by both the teacher and students until the children in the group could read all of it themselves.

Besides the trade-books that we tried out as read-alongs, both teachers wanted their classes to be familiar with a typical basal reader before they left first grade. Since Dick, Jane and Spot seem somehow to have become part of our cultural heritage, we agreed. During the second semester, each teacher spent several afternoons having the whole class take turns reading aloud from the pre-primers and primers. These sessions were not observed, but the teachers reported interest and high participation in the reading. One teacher wrote, "They were all familiar with characters (probably through brothers and sisters or friends). Very enthusiastic, - good review of some vocabulary - went fast, whole book in half hour." In the suburban classroom, the primer and pre-primer were read in nine half hour sessions. (Although these books were then placed in the classroom library, they were not observed to be read again by individuals.)

Besides the Little Tiger books (there are four in all) other read-alongs that the children liked and that helped increase their vocabulary were Go Dog Go, Hop On Pop, Snowman Snow and a ditto master called "Space Shot" from Continental Press (which we dittoed and stapled). The titles of the read-alongs and the dates when they were used in both classes can be found in Appendix C-2. We chose not to give Group I in the rural school many of these read-alongs during the second semester because they began to move quickly through the texts and were enjoying the regular reading program so much. In contrast, read-along books were chosen for Groups IV and V in the rural school in lieu of texts in June. Two of them, Come and Have Fun, and Hop On Pop were used for several lessons each on rhyming. Several days were also spent on Pins and Pans which follows the Sullivan Primer. This book had been read by other members of the class for free reading.

Throughout the year, particularly in the suburban school, the teacher noted that the students weren't stopped by unknown words or upset by difficult passages. The reason for this may be the early introduction and unthreatening nature of the read-along-with-me stories.

Staff-prepared Stories

The second alternative open when no appropriate published materials seem to be available at a particular level is to write your own. We wanted to prepare students to read Story Fun, a book with

124 different words, but decided to introduce in the home-made story words not only common to Story Fun but to any reading. The resulting story, My Pet, introduced 30 new words plus 9 "old"ones. This was an experiment of sorts. The booklet was typed on ditto sheets on the primary typewriter, cut into 5 x 8 pages, and stapled. There were no pictures and sentences occasionally spanned more than one line.

During the year of observation which preceded the study, observers of the basal reader program had noted that, perhaps because of the one-sentence-a-line format in most pre-primer and primer level basals, the students developed the habit of dropping their voices at the ends of lines, and then carried this habit over into more advanced material where a sentence continued from one line to the next. We wanted to accustom children to the usual format early enough to avoid this problem.

The story is in the form of a riddle and each page adds a detail to help the child guess what the pet is. It uses personal and relative pronouns, function words, the verb be, other common irregular verbs, and a few question words. There are no pictures; the language is colloquial; sentence structure includes statements, questions, compound and complex sentences; there is repetition but slight variation in form from one page to another. For example, the tag sentence on several pages varies from "Now do you know what my pet is?" to "Now do you know what he is?" to "Now do you know who he is?"

Next we adapted an old story called The House Where Nobody Lived. It was a fancier production since we'd learned something about book-making. In this story, we printed only one line a page, and allowed the children to illustrate each page themselves. After reading this story the children had been exposed to 30 more words, and we felt they were ready to try a published text.

Beyond this point we no longer kept a record of the number of words or frequency of repetition in the reading matter presented.

Our attempts at story writing taught us something about the physical format we should have. We discovered that one line a page is too little since the children can't take advantage of what repetition there is by seeing the same word or phrase elsewhere on the same page, and besides, the continuous turning of pages is boring, and takes too much time and effort. Size of page seems to make a difference as well. The 5 x 8 page was easier for the child to hold and attend to than a larger page. Whether pictures were absent or present seemed to make no difference, nor did a sentence that occupied more than one line of print.

During the second semester of the first year, after the children had been reading published texts, we wrote a story meant as quick vocabulary review and called it Another Pet Story. Still later, disappointed by the text of three beautifully illustrated fairy tales (Ugly Duckling, Billy Goats Gruff, Three Bears) we covered the text and wrote our own. All four stories were used again the second year.

During the second year, in addition to the staff-prepared stories already at hand, several others were written especially for the rural children who needed to have more exposure to familiar material before they could advance to something new. One such story was "My Word Book" written and tape-recorded for use with reading groups III and IV to reinforce words they had encountered in the teacher-composed sentences. Another was a "book" called Cat & Dog especially prepared as a first book for the lowest reading group. Three booklets of riddles were written to review the vocabulary in the Chandler series. The riddles provided the teacher with a way to evaluate the students' progress up to that point. If a student could read them with few or no errors, he was ready to proceed at a faster pace into new material: the sequence to follow was My Pet, Little House and Story Fun. Since students had not been rushed through any of the introductory stages, by the time they encountered these review stories all were able to read them with few errors. The major difference was in the time taken to reach this point.

Special sub-routines

The use of the Michigan and Sullivan programmed materials can be considered sub-routines for use only with a few children. It proved necessary the first year to use Sullivan with only two children, one of whom was able to join a regular reading group before the school term ended. Both of these children after examination by psychologists were judged to have emotional problems and one had severe perceptual difficulties. They were said to need the careful structure provided by such a program. During the second year, however, the Sullivan program was introduced to almost all rural students as a supplement to, and during the first part of the year, in lieu of our faster paced correspondence program. The rural class as a whole was exposed to parts of the Michigan program as well.

It soon became apparent, however, that at least four of the children in the rural class were not yet able to benefit even from these slow-paced approaches to reading. By the end of October, it was decided that we should not try to push these Group IV rural children prematurely into reading, but ensure that perceptual skills and other necessary language skills be stressed instead. Accordingly, a different set of criteria was decided upon -- our expectations of what they should be able to do at the end of the year. At the same time a set of reading exercises was prepared, a kind of "high risk" reading program, (both in the sense that the students were a high risk as readers and that the exercises were written on a day-to-day basis after watching the students' response to the previous day's work). The first lessons introduced simple sentences using the students own names and the words sad, mad, glad; for example: Mary is sad. Each sentence was heavily cued by a symbol face - one they had learned to respond to in the coding unit.

The lessons included directions to the teacher to help implement the aims we had decided on. A list of these aims and a description of the program are given in the section on Procedure in this chapter.

Published materials

Following the read-alongs and staff prepared stories, we moved into hard-cover texts. The material we found to be suitable came from texts which are supplementary to certain basal series. Some of these are called literature series and are meant to be read after the basal. Frequently these books contain many folk and fairy tales as well as some poetry. There is a certain stylized form in fairy tales, and the natural repetition inherent in the genre served our purposes. Several stories were repeated in slightly different form in several of the books and this allowed the children to make a few critical judgments. (Appendix A-3 lists all commercial and staff-prepared materials used during the study.)

Appendix C-3 shows actual books read by each reading group in each school and the month each book was completed for both years. Figures I and II show the texts read in reading groups during the second year.

The number of texts and total number of pages read is given in Table 1 for each group in each school. (The S-F series through book 1 adds up to about 470 pages.)

Some rural children progressed as far as Storyland Favorites by June. Group II in the suburban school read beyond this into a Reader's Digest book, and the children in the suburban Group I read 4 or 5 more books.

In the rural school, the first three reading groups, 13 children, were reading end-of-first-grade material by June with very few errors. Group IV, 3 children, were able to read easy first grade books, and the special group of 4 children had just begun regular primer material.

Table 1

Number of Texts and Pages Read (by Group)

	Group	N	Texts		Read-Alongs
			N.	pps. read	N. of Books
Suburban	I	10	15	1780	8
	II	6	10	1175	5
	III	4	9	1109	5
	IV	4	7	891	5
Rural	I	3	9	1041	6
	II	5	6	763	6
	III	5	5	565	7
	IV	3	3	210	10
	V	4	3	97	10

Part II – Procedure

This section concentrates on procedure during the second year, since procedures were similar both years.

The sets of materials available were varied enough and flexible enough for the teachers to make choices depending on the needs of particular children. In general, however, both classes began with teacher-composed sentences, then read the six Chandler books and the three riddles reviewing the Chandler vocabulary. They proceeded to the home-made stories "My Pet" and "Little House" introducing new vocabulary, and finally began to read the literature texts, which progressed from easy to more and more complex material. It is in the pace that the differences occurred.

Pace

The following charts show the position of both classes at the beginning of November and again at Christmas.

The Second Month (Oct. 13 - Nov. 9: 25 school days)

Suburban			Rural		
Grp.	N.		Grp.	N.	
I	8	finished Ladybird la, lb. finished the 6 Chandler booklets. 2 boys in SRA	I	6	finished 1st Chandler. beginning 2nd Chandler. on Lesson 10 of Sullivan.
II	8	reading 3rd Chandler	II	5	beginning 1st Chandler. on Lesson 9 of Sullivan.
III	2	beginning 2nd Chandler	III	5	no text. Teacher composed sentences using early Chandler vocabulary. Lesson 6 of Sullivan.
IV	6	beginning 1st Chandler working in Sull. Pre-Rdg. Bk.	IV	4	No text. Teacher composed sentences. Letter- naming Began Special Program on Nov. 7.

Third & Fourth Month (Nov., Dec.: 21 school days)

Suburban Grp.	N.		Rural Grp.	N.	
I	8	had read 3 riddle books, "My Pet", and "The House." (From this point on, the teacher did not pre-teach new vocab. words.) Were on p. 28 of the hard-cover book: Story Fun.	I	6	finished 3rd Chandler. Sullivan Primer p. 38.
II	6	finished the 6 Chandler booklets.	II	5	finished 2nd Chandler. Sullivan p. 33.
III	4	began the 5th Chandler.	III	5	preparing for 1st Chandler by reading teacher-composed sentences. Sullivan p. 16.
IV	6	had just begun 2nd Chandler. were on p. 54 of Sullivan Primer.	IV	4	sequence cards. Letter naming; special program.

Although differences between the two schools are even more apparent by the end of the second and third periods, the materials we had chosen turned out to be flexible enough for use with both classes. Adaptations and revisions were possible and this section centers mostly on our attempts to find successful ways to do this.

Observation Data

Suburban

The observer in the suburban school made the following comment on 10/26: "The middle two groups with review picked up confidence and are now able to go into subsequent Chandler books slowly. All children are happy in their groups and seem to be comfortable. Even J. (new 5 year old transfer from Kindergarten) is more confident - does all her work conscientiously."

We had been worried about J. who had spent her first week or two in the room without any voluntary oral or written contribution. We had decided to try to make her feel more comfortable and not demand anything from her before she was ready. We were relieved that she had made up her mind so soon to tackle first grade work.

By December, membership in each reading group had changed. The five-year old had moved to Group II along with two other children from Group III. Two children were reading in more than one group.

Several opportunities had been provided for children to read in pairs. Two girls from Group I had voluntarily used free time to read to each other from the Chandler books.

The written work was now differentiated for different reading groups. This provided work suitable to abilities and to the time necessary for different children to complete the exercises.

One boy who came to school already reading was now on the orange series (4th set) of the SRA Reading Lab; on Nov. 14, after preparation, he read parts of Reader's Digent - A to a friend. The observer felt he still needed more books and crossword puzzles. We tried easy science books containing experiments and other activities, but these didn't catch his interest. When his mother agreed that she had tried the same thing, we discovered that besides just trying science materials, she had also purchased the Sullivan Programmed Reading Texts and had taught him to read the previous year. Later, it came to light that the SRA materials were also available to him at home.

On Nov. 17, the observer noted, "Children are reading very well now. Perhaps Mrs. C. could concentrate more on expression now that errors are so few? She is giving more phonics cues and the children are picking them up." Rather than concentrate on expressive reading, much more silent reading had been attempted so far this year than last, but it was too soon to tell whether this practice would have any effect on speed or comprehension.

Rural

The tape-recorder was used to present stories the children would encounter that day or the next with the teacher. Groups I and II heard Swings before reading it with the teacher; and the first read-along, Little Tiger Learns His ABC's, was also taped for listening with all but Group I. A home-made book, "My Word Book", was taped and used with Group III and IV to reinforce words they had encountered in the teacher-composed sentences.

During small group time in the rural class, the teacher included work on letter naming, teacher composed sentences, arranging sequence cards to tell a story, the Sullivan program, and some work in sound-letter correspondences. Prior to the small group work there was frequently a full class period in which one or more of these activities was introduced.

In Group I and II, the teacher pre-taught much of the vocabulary in Swings and Slides by use of teacher-composed sentences. The children arranged cards with these words printed on them to make up their own sentences, pointed out which sentence the teacher had just said, or matched a sentence to the correct picture. End of sentence punctuation was pointed out during this practice.

In Groups III and IV much time was spent recognizing colors by name and then matching to the correct color word. The observer noted that one child in Group III still was getting confused about the meaning of the words "same -- different" and that another in Group II was making mistakes in the Sullivan Material. The early teacher-composed sentences were reviewed by both groups, but with the slowest moving group an attempt was made to use the small vocabulary from the Coding Unit. Examples are: Go to ___. Find a ___. Get ___. followed by a symbol picture. The child was allowed to perform the action when he could "read" the sentence. This procedure was not successful. There was no appreciable gain in recognition from day to day and the initial letter similarity of go and get was actually causing interference. It was then that a special "high risk" sub-routine for Group IV was decided on.

Throughout November and December, taping of the Chandler stories continued. To decide whether listening to these tapes made a difference in oral reading performance, only half of the children in Groups I and II heard Slides on tape before they read it orally. A record of errors during later oral reading showed a tendency for fewer errors to occur among those children who had first heard the story, but a sign test indicated that this tendency did not reach statistical significance. Nevertheless, the next Chandler booklet, Trucks was taped and the listening continued since both teacher and observer had found sufficient differences in the listeners' later reading performance.

The Second Semester

Comparison of Classrooms at the half-year

During the January and February period there were growing differences between Group I in the Suburban school and all other groups whether Suburban or Rural. These seem to be qualitative differences although what is most easily seen is the quantity of reading matter the children were able to assimilate.

Jan. - Feb. (45 school days)

Suburban Grp.	N.		Rural Grp.	N.	
I	10	My Pet I Know a Story Stories to Remember read silently & discussed each story in Tales to Read began to read silently in Let's See The Animals (hard-cover Chandler)	I	6	finished Chandler, home-made riddles & stories, on p. 10 of Story Fun - first hard-cover text. Sullivan primer, p. 101.
II	8	are in I Know a Story p. 44.	II	5	Began 6th Chandler Sullivan Primer p. 84.
III	2	finished Chandler and home-made riddles and stories. finished Sullivan Primer. (did not continue in Sullivan)	III	4	Began 4th Chandler Sullivan p. 69
IV	4	began 6th Chandler. Sullivan Book I, p. 10	IV	5	Special Program.

Suburban

The top group in the suburban school had now been increased to 10 members (the 5 year old moved up from Group II). Group IV in the suburban school lost two of its members to a new Group III since informal tests showed that these two members had made 5 or fewer errors reading a passage composed of 50 Chandler words. Besides, they were beginning to be bored at the slow pace of the lowest group, and the same test showed that they read faster as well as more accurately than others in the group.

Rural

In the rural class, a girl transferred from a down-town school into this first grade in January. She had completed the readiness picture book of the S-F Series in her previous school. In reviewing this book with the teacher, she was unable to remember the names of the children in the pictures (Dick, Jane, etc.), and was placed with the "High Risk" Group in reading. A girl from Group I moved away from the area after Christmas, thus making one less child in Group I and one more child in Group IV.

Examination of the weekly data in the rural school during the January-February period shows a decided change both in the quality and quantity of the work. Somehow, the class had come alive! The teacher spent the first period in the morning (about 40 minutes) with the whole class, and one of the lessons during this time was handwriting. But handwriting had become a vehicle for writing sentences about the children in the class, sentences that also reviewed reading words and contrasted capital and lower case letters. The children vied with each other to read the words as the teacher wrote on the chalkboard. Interestingly enough, as soon as someone said the correct word, all other guesses stopped. Then the child whose 'sentence' it was got to read it alone. Each sentence was carefully set-up so that this child could read it. For example, our notes show that a boy in the 'high risk' program could read "Ricky can run." and similarly each child named could read "Eddie likes to eat.", "Hugh is happy.", "Wendy will win.", "Peter and Pearl can push." or "Todd is here today."

Many children were now able to finish sentences orally. The teacher wrote: "I will ___." or "I can ___." and children thought of appropriate ways to complete the sentences. After this practice together, the class was assigned to write their own individual endings.

On January 30, one boy in Group I and one in Group III read Swings to each other voluntarily, beginning a practice we had encouraged but had not forced.

Most of the Michigan Listening program had been completed by the end of February (through p. 217). Teacher composed sentences had continued to use names of the days of the week, and now the teacher began to include the name of the month in sentences. Those were practiced with the whole class right after opening exercises. Some work with opposites was begun.

In many ways, the work being done and the responses of the children look a good deal like the September and October data from the suburban school. This comment is not meant to be disparaging but rather just the opposite. From at least half the rural class, responses during the full class lessons were qualitatively the same as the suburban class in September although the reading chart for this period resembles the progress in the suburban school at the end of December.

Written Comprehension

During the first year's try-out, story-line was discussed during the reading sessions but few written questions were prepared on the assumption that whatever the child could decode at this level, he could understand. During the second year much more stress was placed on silent reading. For this reason, story comprehension was tested by written questions in February. A selection from the current reading material was chosen, and four or five questions to check understanding were prepared and typed on the primary typewriter. When the group reached that selection in their reading, they were requested to read the story silently and answer the questions. During the next reading period the story was taken up as usual.

In both classes, with some notable exceptions, most questions were answered incorrectly. There are several probable reasons: most of the reading groups were not used to silent reading without guidance; none had had practice finding specific answers in a text; the questions were difficult; and the page format was cramped. For whatever reason, the poor results did point to a gap in the reading program which had to be filled. The most disappointing aspect of the written answers, whether fill-in or true-false, was the apparent randomness of the reply. We decided that strategies for finding answers and judging their acceptability must be acquired. The practice began with oral questions and answers during the actual reading lessons. Our aim was to show the children how to answer simple fact questions about something they had read....questions of the who, what, where and why variety.

At first, even when the children could read a story to themselves and tell it afterwards in correct sequence, they seemed stymied when asked a simple question about the story, nor did they have strategies for finding out the answers by re-reading. We prepared lessons for both classes in which we wrote one or two sentences followed by a single question. The teacher and students read the sentences and questions together and the teacher showed the children how to prove whether their answers were right by looking at the relevant part of the sentence. Gradually, the paragraphs extended to three and four sentences and finally to a whole page story. All questions and answers were checked against the text. The child who answered could thus prove his answer much as one used to prove an arithmetic example.

Questions were also prepared to accompany some of the regular reading group stories. Children were encouraged to use their books to answer these questions.

One reason for the initial difficulty with comprehension might be that the questions asked were adult questions (either in form or type or both) and perhaps not of intrinsic interest to first graders at all, since even the bright children had to be taught how to go about answering. Perhaps six year olds don't segment experience the way an adult does, at least without some instruction into the process. There are some indications in the literature that not even adults see things logically except in certain situations where they have learned to be logical. Perhaps we can blame Aristotle for the way we customarily slice up our world, but at any rate it is probably necessary to indoctrinate children into this way of looking at the world at some point in their schooling. Our first graders readily learned what was expected of them and performed acceptably in a very short time.

Reading Rate

A further change in the reading curriculum took place in the suburban school during the last few months of the second try-out. Most of the students were reading at grade level or above, but some were reading very slowly. See section on Informal Testing later in this section.) The observer worked with two students over a period of several weeks to increase their speed of reading. The two children who were given special drill in increasing their reading rate had been the slowest, in terms of speed, of the children in Group I. Their speed was comparable to children in the middle of Group II. When given the familiar Chandler Trucks to read on five different days, each child reduced his time in reading the 111 words in this text. The girl began by taking 1 2/3 minutes, and on the fifth day read the selection in one munute 4 seconds. The boy began by taking 1 1/3 minutes and brought his time down to one minute and 4 seconds too. The following week, to see what would be the optimal time for them to read and comprehend, material new to them was presented and questions asked after the silent reading. The first time, the selection of 104 words was read too quickly by both children to answer the questions correctly. Their best reading in both weeks was about one word per second, or 60 words per minute. This is, of course, much slower than most adult oral reading times which have been estimated at about 165 words a minute by Carroll (1964), but it seems to be about the best speed a first grader can manage and still understand what he's reading. Of the two children who got special practice, the boy was eventually able to increase his speed up to this rate and still understand the content; the girl was able to stop visible sub-vocalizing when she was asked to read silently, but her rate did not increase appreciably without loss of comprehension. The optimal speed of first graders reading first grade material is not known. Our current guess, based on samples of timed readings over two years, is that one word per second is probably quite fast.

Besides this pilot study with two children, some extra work on increasing speed was attempted with the top reading group in the suburban school. The teacher used part of the group reading time to have the youngsters re-read familiar material as quickly as they could; she showed them how to scan a page to find a single piece of information; they read phrases that were written on oak tag and held up for just a few seconds. These phrases and sentences were constructed so that they contained longer and longer phrases or "chunks" as the lessons progressed.

Three stop watches were brought in (the children were accustomed to seeing them used by the observer at other times) and pairs of children timed each other's reading of short selections without supervision. This last proved highly motivating, especially to the boys in the room. The purpose of these exercises was not so much to produce Evelyn Woods type speed readers as to force the children to really read silently at a rate where they weren't mouthing the words. Not all children could do this at the end of the year but all of the top group and some of the second group seemed to be reading silently. A visitor to the class in April noted that one boy in Group I was late in joining his reading group. While other children read, he found the correct story, glanced quickly down one page, turned the page, glanced down the next two pages, turned the page, glanced down the next page, backtracked to the correct paragraph, found the place, and began to follow the oral reading. This child, at least, had learned several of the reading skills we had been trying to teach.

Reading Groups

As mentioned before, the grouping of students was flexible but not heterogeneous; children were grouped by attempting to discover who was moving at the same pace and who needed the same kind of review. At times students would read simultaneously with two groups, or move to one group for extra phonics practice only. When it seemed that a child was ready to read at a faster pace there was no problem transferring him from one group to another. We believe this was due to the type of materials used, the lack of emphasis on memorization of words as a prerequisite to group membership, and the fact that the program for all groups stressed a variety of available strategies to help read new words.

Moreover, when several books at the same level but from different publishers were used in succession it was easier to move children from one group to another. The vocabulary load varies from one book to another but is never as high as a book at the next higher level. In this way a child with less reading experience could move to a group who had more experience in reading.

In deciding to place a child in a higher group we relied on daily observations of oral reading, daily written work in phonics and comprehension, results of monthly taping of oral reading, and informal diagnostic tests. In observing the child after he had moved to the new group, daily observation records were discussed at the teacher's meeting, written work examined, and his oral taped reading compared to other members of the new group.

The error scores for three students who were moved from one group to another in the first year's try-out were compared to see whether these individuals had scores more like the group they left or the group they moved to. The two students who were transferred up to the middle group had a much lower error rate than others in their group before they transferred, and after the transfer their error rate was comparable to, or less than, others in the new group. The one student who moved from the middle to top group received scores before the transfer far lower than most middle group students but after the transfer had a higher error rate than other top students. His error rate on 'new' passages in the tape recorded test sessions fell somewhere between both groups.

Changes in group composition was even more frequent during the second year's try-out. In the rural school during the second semester, only the three best readers remained in Group I. This allowed them to move at a much faster pace for the remaining months of school. Two boys who were moving more slowly were changed from Group I to Group II. The special "high risk" group remained the same but the remaining children were divided among Group II, III, and a new Group IV. In general, the moves were to smaller, more homogeneous groups in this school.

In the suburban school, membership in groups remained fluid throughout. One case, however, illustrates certain conditions that must be considered in changing a child from one group to another. When a boy moved from the second to the top group, he suddenly stopped trying or paying attention. When told he could read with his "old" group whenever he wanted to, he chose the slower paced second group and began to relax and work again. Others did not share his tensions. Two girls chose to read with both Group II and III all semester. The teacher, however, geared their instruction to Group III work. On April 27, two of the four boys in Group IV moved up to Group III. (Several comments by one of these boys showed that he had psyched out the relative reading ability of each child in his old group. He had placed himself in exactly the same position we had!) The two boys left in the lowest group met separately with the teacher in May and June. In June, the teacher also gave special help to two Spanish speaking boys who had just joined the class.

Informal Testing

An Informal Reading Inventory was administered both years in the suburban school.

The First year

This informal test was given to the children individually during the last week of March and the second week of April (vacation intervening). Selections were taken from some of the early materials read by all children, and several selections were chosen from each level of a basal reader from grades 1 to 5. The selections were typed on a primary typewriter.

The child read one selection at a time silently; the reading was timed; he then answered several comprehension questions orally. At the discretion of the examiner, the children were sometimes started on first or second grade material, rather than the pre-primer. The test was terminated when a child could answer only half of the questions; or the time for silent reading was very long; or he was obviously being frustrated by the task.

In scoring, each answer was given one point. The child was credited with points for selections below which he began reading. If, during the silent reading, the child asked how to pronounce a word and that word was later necessary for a correct answer, no credit was given even if the question was answered correctly. Comprehension scores were simply the cumulative correct answers given.

Two students (08%) were reading at the pre-primer and primer level; five (20%) were reading at first grade level; five at the second grade level; four (17%) at the third grade level; five (20%) were at the fourth grade level; and three (12%) at the fifth grade level. About 72%, then, were reading at a level beyond first grade.

Rates of reading were also recorded. What we would expect to happen is that those children whose comprehension scores put them at a higher level would read early selections faster than children whose total score was at a lower level. For instance, someone answering all questions correctly up to and including a fifth grade level would probably read easier material faster than someone who could only read and answer questions correctly at a third grade level. In the main, this did happen, although not with perfect regularity. But it seems that first graders who can comprehend fifth grade material take no longer to read it than other first graders read and understand material at a lower reading level.

The Second year

The Reading Inventory was given earlier this year, February 9th and 10th, and was administered individually to members of Groups I and II in the suburban school partly as a check on appropriateness of group membership. The selections were read orally by the student this time since we had begun encouraging silent reading earlier this year and felt we needed a check on word recognition skills. Scores were derived in the same way as the previous year, that is, cumulative correct answers to comprehension questions.

One student was reading at the primer level; nine (53%) at the first grade level; five (29%) at the second grade level; and one (06%) at a grade three level. We can assume that the eight students in Groups III and IV, not tested, were reading at grade one or below*, and therefore, at the half year, 6 students out of the 24, or 25%, were reading and comprehending above first grade level.

The time taken to read the selections differed for Group I and II. The number of words read per second for each group is given in Appendix C-4. In Group I, the three students who read all four of the Grade Two passages were reading much faster (2.7 words per second) than the total group of nine students who had been able to read through only Passage 1 of the Grade Two material at about one word per second. Reading Group II read more slowly on the average than Group I, that is, they read about one word every two seconds. As a result of these tests, work on increasing rate of reading was attempted, as discussed earlier in this section.

"High Risk" Program

During all this time, one group of four children in the rural school (and after Christmas, 5 children) had participated in a reading program all their own. In November, we had redefined our goals for these children. We wanted them to have the following skills at the end of the school year.

Goals

1. Alphabet

    a. say letter names in alphabetical order looking at alphabet chart; without chart.
    b. point to correct capital or small letter on chart when teacher says name.
    c. point to correct capital or small letter from random set of 5 letters.
    d. name each letter from a set of "Flash Cards".
    e. write each lower case letter from dictation in any order.

2. Discrimination

    a. follow with finger each word in sentence as teacher or another child reads.

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* One member of Group III was tested to check on this assumption and answered 15 questions correctly. This put her at the Primer level.

b. discriminate between letters and words.
c. identify visually 3-letter groups as same - different. Identify where difference is.
d. identify auditorally minimal word pairs as same - different, when initial letters only are changed.
e. know difference between the terms "rhymes" and "begins the same".
f. identify rhyming words - auditorally and visually.
g. identify beginning letters in pairs of words e.g. Teacher says: "bear-pear" and asks: "Which begins with b." Teacher says: "sing, song, wrong" asks "Which 2 began the same way?"
h. identify initial consonant of a given word, e.g. Teacher says, "Bear -- what does it begin with?"
i. produce additional rhyming words - produce additional words that begin with same letter/sound.

3. Motoric

trace a line; connect series of dots; copy a simple figure; trace shapes to make designs; make clay figures; shape letters from clay, cut and paste pictures or shapes; jig saw puzzles; place classroom desks in straight lines.

4. Concepts - Language Development

a. place relations: left-right, up-down; over-under.
b. classification; sort pictures into piles - e.g. things to eat vs. things to play with; be able to say what's alike about all things in one pile.
c. sequence: order pictured events; re-tell simple story, remember and do school tasks - follow simple directions.
d. discriminate colors.
e. days of week.
f. answer a question with a subject-predicate sentence. Describe a game or T.V. show.
g. tape-recorder, listen to "good literature".

5. Reading

a. Read-along books with simple format e.g., Golden books, Chandler, etc. Teacher does most of reading initially. Students follow along. Use of books for language development, review of initial consonants, (use children's initials first i.e., m,d,s,r,j), follow each word as teacher reads, name letters, count words, reread at some point to try to elicit any words child can recognize.

b. Teacher-composed sentences using child's name, colors, directions to make or color, a few nouns & verbs that are highly frequent & visually different (AA words in T-L: e.g., hop, sing, run, jump, can, will, is). Over-learn those words in isolation and in sentences. Use simple inversions: It is ___.; Is it ___?

Of these aims, only parts of No. 1., Alphabet and No. 5. Reading, are different from the aims of many kindergarten programs. The children we were dealing with, however, did not have these pre-reading skills in October. One little girl in this group, a first grade repeater, could not often recognize her name or identify the first letter in her name. There had been few if any observable gains from the program they had been following so far in first grade.

In the pages that follow we describe the special programs prepared for these youngsters, and tell how they responded to it. This program was built to incorporate the pre-reading skills listed above and, incidentally, to introduce some beginning reading tasks. We were particularly interested in providing highly motivating activities, since these children had been frustrated up until now and it was hard to keep their attention on school work. Furthermore, we felt they were not ready for analytic reading tasks. We tried to prepare lessons, therefore, which demanded the maximum number of child responses, responses which we wanted to lead them to give correctly. No matter how slowly they moved, we wanted these children to be successful at the tasks we set. The way we chose to do this led directly from the manipulation they were familiar with in the Coding Games and the teacher composed sentences. Moreover, the words we chose to present were those which would appear over and over in any subsequent reading texts they would encounter.

In sum: most of our goals were pre-reading goals; the material would be simple, with high motivating factors, and with words that had simple referrents. The vocabulary had to lend itself to simple sentences.

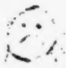
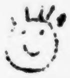
First Lessons. With these things in mind the first corpus included:

a) the children's first names: Mark, Jim, Ricky, Donna (There were two Mark's in the class and this Mark insisted his last initial be added -- so after the first lesson, he was identified as Mark C.)
b) is
c) mad, sad, glad

We thought their first names would be motivating and that they could learn fairly easily to recognize names of their friends. The words sad, mad, glad are pictureable and each can follow is to make a sentence. Use of *is* would allow questions and answers to be composed. Further, although *mad*, *sad*, and *glad* are not easily discriminable one from the other, if the children could learn to discriminate them via their initial letters, they would have learned the sound-letter correspondences of at least two of the initial letters, *s* and *m*, and we might be able to elicit a correspondence principle, namely, words that look alike at the end (rhyme) usually sound alike, too.

To give an idea of the general method we will describe the first lesson in detail. The children were presented with an oak-tag strip about 3" by 12" on which one sentence was written. The sentences were:

Mark is sad.
Jim is mad.
Ricky is glad.
Donna is sad.

Each sentence was followed by a face: sad  glad  mad

The sex of the subject was indicated by hair placement around the face, a detail we never called attention to.

The lesson contained 4 steps. First, each child identified his own sentence strip. Next, he tried to read it, pointing to each word as he read. Third, each child tried to recognize the names on the other cards. Finally, the teacher wrote a sentence on the board but left out the child's name. Each child looked at his card to see if his name was appropriate to the sentence (really visually matching *sad*, *glad*, *mad*). After matching, the teacher wrote in the appropriate name. The child then drew the matching face next to the sentence on the board. The children then read all four sentences. They were allowed to keep their own sentence strips.

Note that in this first lesson no attempt was made to teach the recognition of anything but names, and to teach the picture association with the words *sad*, *mad*, *glad*, although we did ask the children to point to each word while saying it. As it happened, there was no trouble associating *sad* and *mad* with the right face, but *glad* elicited *happy*. (The Coding Unit had used face symbols for "happy" and "sad;" a later version used "glad" "sad" to avoid this kind of interference.)

Our notes show that the children had difficulty only with the first reading of their own cards. At this point the faces were discriminated with teacher help. They had very little trouble (one error) recognizing each other's names; and during the last step of matching sentences and filling in names there were no errors. Mark objected to being called *sad* and this tactical "error" was rectified in future lessons.

Content

Succeeding lessons were written from day to day as we saw how the children were responding to various strategies. At the end of 30 lessons and two home-made books, the children read the first Chandler book Swings, went on to Slides, and spent the last two or three weeks of school reading read-alongs with the teacher. The vocabulary words introduced in the 30 lessons can be divided into groups as follows:

is, am, are, can, will, won't
run, jump, swing, push, go, going
I, we, me, you
cat, dog, Peter, Pearl, Mark, Jim, Ricky, Donna
sad, mad, glad, big, little, high, here, red, blue, all
a, the, to, off, yes, no

Strategy

The major strategy was to use simple sentences heavily cued by a picture and gradually compare similar sentences while fading the strength of the picture cue. Many written exercises were prepared to follow group work. These began with simple matching but moved rather quickly to choices of either the correct picture (out of two) for a given sentence, or the correct sentence ending (out of two) to correspond with a given picture. At the same time the sentence materials were used to play matching games, listen for sounds in words, identify rhymes, and so forth.

The children learned the word associations of the pictures very quickly; it was soon possible for them to choose alternatives to three different sentences when given a picture. For example, we could picture a person who was sad or glad, and also little or big, and was either running or jumping. We learned to have only single word choices and to put them at the very end of the sentence; otherwise the children got lost somewhere in the middle of the sentence and gave up or answered randomly.

The teacher used a number of different strategies to provide variety. One was to ask children to fill-in or erase using the chalk-board, and the other was to use word cards so the child could construct his own sentences.

In the word card games, each child received enough words to make several sentences. First, the children would be asked to make specific sentences, either all the same, or each his own. Then, they would be asked to make any sentence they wanted. Silly sentences were introduced early, and these were accepted, read, and laughed at. Use of word cards was a very successful procedure, partly because of its flexibility. It involved the children, they thought it was great fun, it taught them to look at words in sentence context, to pay attention to word order and to meaning, but also to look at each individual word carefully.

Sometimes, review was taken care of during a phrase lotto game. Since there were so few children, the teacher could check to make sure each child was reading the correct word before giving him a marker to cover it.* Another review game we called "Faces into Spaces." Each child was given 3 cards containing a sad, mad, and a glad face. A large page was placed on the slot chart showing people in various situations, some of whom had no faces. In the space where the face should appear was written one of the 3 adjectives. The children read the word printed on the blank face and pasted in the correct face. Some blank faces had no words written on them. For these, the children decided who should be sad, etc. They pasted in the correct face, said the adjective, and then found the word they had just said from a list at the bottom of the page.

In short, the lessons provided lots of review and lots of activity and manipulation for the children, as well as activities that would produce a maximum number of responses.

Procedure

Before Lesson 4, children could "read" the faces (mad, sad, or glad), but couldn't read the adjectives without the faces as a cue. By the end of Lesson 5, they could identify their small corpus of words better than they could name the letters in their own names. By Lesson 6, they knew and could discriminate between mad, sad, and glad with the face cues.

By Lesson 11, three of the children could write on the board from dictation the words sad, mad, and glad. After practice in the read-along Go Dog Go, they could all find and identify individual words. Ricky could now point to words and not letters when asked. Mark still could not be depended on to identify the first letter in his own name, and often explained that he had "just forgot."

By Lesson 13, one child showed definite signs of beginning to read independently. He made very few errors in oral or written work and started to coach others and correct them. His excitement sparked the others in the group. All the children could now see a sentence written on the chalkboard, have it read to them, and then point to and say any individual word when requested. But it seemed that every time we were ready to relax and let the program continue on its own momentum, some setback occurred that we hadn't bargained for. At this time, for example, much to our dismay, some of the group began to want to read from right to left!

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*We never used this game as a whole class activity since there is almost unlimited opportunity for undetected wrong choices.

The word am, introduced with I in Lesson 17, caused lots of trouble. The children's own spoken language patterns didn't help them know when to expect am or is. The increased vocabulary introduced in Lessons 18-21 seemed to precipitate a reversion to random guessing. For example, Ricky was read is, and you was read can. The written review work prepared to accompany these lessons was too difficult and so didn't do the intended job, either. These worksheets would have to be revised if the program were to be used again.

The work on pronouns during this time was more successful. One boy who habitually used "me" in his own speech in both subject and object position actually changed his oral usage during this time. Of course, our program was not the "cause" of this change, but it is possible that his attention was drawn to his own idiosyncratic usage by exercises which varied I and me by position in the sentence. Another happy occasion occurred when off was added to jump and children were able to figure out the new word (from picture or context probably) without help.

When the first book was introduced, the children were delighted. They had wanted a book to read (they asked us!) so we pasted our own text over the print in multiple copies of a hard-cover supermarket book called Cat and Dog. Motivation was high and performance was good. Even though all the words encountered in this story had been seen before, the children spent four lessons reading and rereading the 33 pages. They answered such questions as "What word rhymes with sad; ____ begins like Jimmy; ____ means not big." They identified the speaker and the person spoken to, and even took parts in dramatizing their book for the class. The children finished reading this book on Feb. 17, and were very pleased with themselves. They took their book home to read to parents and voluntarily read it to anyone who came into the classroom. It is probable, although untested, that the children could "read" this book as easily if they held it upside down as right side up. Testing at the end of February showed, however, that most of the words could be read in new context and without picture clues. So, at this point, transfer to new context had taken place.

(At this point, Peter, from the next higher reading group, sat in with this group for some needed review and so his name was used in the sentence practice.)

Their second home-made book presented some new words in preparation for the first Chandler book: Swings. When high and here were presented, the children got so confused that we decided to load the context as heavily as possible to help identification, and not ask that these two words be identified in isolation. It had, after all, been our mistake to place them together in the first place. Nevertheless, a lesson was written, Lesson 27, analyzing the letters and sounds in both words and comparing them.

Another pair of words that caused confusion was will and won't. It was only when will was added and sentences using minimal discrimination between these two words were presented that the children's reliance on the initial letter for recognition of won't became apparent. After some practice, the will -- won't confusion lessened.

Surprisingly, the next problem came in distinguishing go and going; since these two words are easily distinguishable by length. During the course of the lesson in which the comparison between the two words was taken up, Lesson 29, most of the confusion was resolved. All but one child completed the accompanying ditto without error. Other verbs with -ing were practiced in the next lesson: push - pushing, jump - jumping, swing - swinging, go - going. The sentence format chosen was ___ is going to ___, or ___ are going to ___. A modified Word Family game (see Correspondence Chapter) using some -ing riddles was presented. The teacher stressed pointing to and saying each word in the phrase is going to, and introduced a review lesson by presenting the written sentence: Jim is going push. One child protested that the teacher had made a mistake; that she forgot to write the word to. These various approaches seem to have given sufficient attention to the written words so that the -ing ending in words no longer presented problems. The Word Family game was so successful, moreover, that other easy word family lessons were written and used at the end of the semester.

Lesson 30 attempted to call attention to differences between big and dog since this was a continuing problem. The ditto accompanying this lesson was completed by each child individually with no errors. After the children began to read Swings, the rest of the lessons that we wrote concentrated on analytic skills. The children listened for words that began with p, and read some new words based on old ones; for example, Rick read pad with no hesitation when it was written under mad and sad. Most could make a new word by changing the first letter of an old familiar word. Two boys became very excited about the rhyming lessons and after they contributed to a list the teacher was writing on the board, they shouted out, "All the same!" when it was finished. (Since this group was given a great deal of freedom, lack of perfect order was the usual case rather than the unusual. We were glad to see this excitement about learning, having experienced the apathy of September.)

Extra practice was given looking at all the elements of a word and not just the first letter. Following Lesson 31, the ditto below was completed without error.

Here how. push. you.
I go. I can swing I can I will push
High here. Pearl. are.

Although we were very pleased, we knew that high performance one day did not necessarily predict attainment. We did not know if the children had learned these words forever or if they had learned always to look at each element in a word. Their performance continued to be variable even at the end of the year and each real gain was slowly won.

Summary

By the last two weeks of school the children could listen to a familiar CVC word and write each letter on the chalkboard. They could make new words by substituting s, m, t, d, or f and they could contribute orally other words that began with these letters. They could identify most of the letters of the alphabet presented in random order. They knew what a rhyme was and could visually and auditorily identify some rhymes, particularly those of the -ing, -at, -ad, -in families. They had a small sight vocabulary of common English words and could isolate or point to any word as it was being read. They had a functional knowledge of what a word is and how to form sentences. They could compose a simple statement or question using familiar words. Briefly, they were ready for first grade reading work.

The ideas in this program devised for "high risk" readers may be useful to first grade teachers who have one or two children in their class who don't seem to respond well to any other approach. The program could be used as is, only changing the children's names. Some of the suggestions for sound-letter correspondence work might have to be adapted to take advantage of first letters in the student's names.

A kindergarten teacher who has students beginning to read on their own (and she can use the Clappy test to find out) might be interested in starting this program with a small group. It could easily follow the Coding Unit.

Part III - Evaluation

In this section is summarized the oral reading performance of the PL children in both classrooms for the staff-prepared passages they read from time to time during the year. In addition, in June, oral reading performance of PL children and non-PL first graders has been summarized. Results of a standardized reading achievement test for the PL children is presented first.

Standardized Reading Test

The school system regularly gives the New York State Achievement Tests every June. The sub-scores on the three reading tests are given below for the PL suburban school for both years of the program, and for the PL rural school after its one year.

Table 2

Mean Grade Level and Range of the Reading Achievement Tests for the PL Classes

Group	Word Knowledge		Word Discrimination		Word Comprehension		Average
	mean	range	mean	range	mean	range	Mean
PL suburban							
year 1	2.3	1.6-3.2	2.4	1.4-3.6	2.4	1.6-3.9	2.4
year 2	2.7	1.8-3.2	2.8	1.7-3.9	2.6	1.7-3.7	2.7
PL rural	1.7	1.2-2.9	1.7	1.3-2.1	1.7	1.3-2.1	1.7

In the PL suburban class, scores are somewhat higher the second year than the first but this difference is less important than the fact that most of the children in both years could exceed the national average on this test, one geared to children learning from a different kind of program.

In the rural school, the average is several months below the national norm, but the range shows that some children were at grade level, and in Word Knowledge (vocabulary) a few were beginning to proceed rapidly.

Monthly Taped Reading: First Year

In these taping sessions the first year when we only observed one class, each child read an "old" passage, drawn from his group's classroom reading, and a "new" passage, which his group was expected to read the next month. Where possible the same test passage was used for all groups, although at different points in the term. The test passages were not uniformly given to all groups because the students sometimes had already read the prepared "new" passage by the time of testing and so a different new passage had to be substituted. Similarly, certain texts were not used for all reading groups and so different old and new passages occurred now and then throughout the year. Results of this and other testing procedures the first year are presented in detail elsewhere.*

New Passages

Table 3 shows mean errors per 10 words on new passages. For unseen and unpracticed material, these figures are quite low.

Table 3

Mean Errors per 10 Words on New Passages,
Taped Oral Reading

Group	N.*	Jan. 13	Jan. 27	Feb. 23	Mar. 17	Apr. 15	May 10	Avg.
I	(9)	1.8	1.2	1.3	0.8	0.5	0.6	1.03
II	(6)	3.9	4.0	2.0	2.6	2.1	1.1	2.61
III	(3)	3.8	5.2	3.9	4.2	3.3	2.0	3.73

* Three students who moved from one group to another during the term are excluded from this and the following analyses.

When a group reaches the same level of material as a faster group, does the slower group read as accurately? Table 4 gives a comparison of children from different groups reading the same passage. We find that the top group clearly outdoes the others, while the two slower groups do not seem to differ.

Table 4

Mean Errors Per 10 Words on Common New Passages

Group	N.	Passage A	Passage B	Passage C	Passage D	Passage E	Passage F
I	9			1.2	1.3	0.8	0.5
II	6	3.9	4.0	2.0	2.6	2.1	1.1
III	3	3.9	4.2	3.3	2.0		

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* First Grade Report, 1965-1966, (Mimeo) Robinson, et al., Project Literacy, Cornell University, June, 1966.

Old Passages

Old passages had been read in the reading groups before being encountered in the oral reading taping session. These passages should produce fewer errors than the new passages just discussed. Table 5 gives mean error per 10 words on old passages for the reading groups.

Table 5

Mean Errors Per 10 Words on Old Passages

Group	N.	Jan. 13	Jan. 27	Feb. 23	Mar. 17	Apr. 15	May 10
I	9	0.6	0.3	0.2	0.0	0.4	0.2
II	6	1.4	0.8	1.2	0.3	0.2	1.0
III	3	2.0	1.3	2.2	0.0	1.1	1.1

Group I started with quite a low level of error on old passages and declined to an even lower level. Group II did too, except that the final (May) test shows a sharp increase, apparently attributable to the particular passage in question. (Group I also had more errors the month before on the same passage.) In general, both groups seem to have fallen to about 0.2 mean errors per ten words on old passages by the end of the year. Group III also shows a downward trend but ends the year at 1.1 errors per 10 words.

In brief, the data on individual oral reading indicate that Group II and III seem to have more in common with each other than with Group I. Although Group III trailed Group II by two months, its members generally made about the same number of errors on the same passage.

Second Year

Because of the difficulty encountered the first year when we tried to compare children reading different passages at different times of the year, we gave all children one standard passage to read the second year. Because we were interested in ability to use knowledge and skill in new situations, transfer passages were constructed from vocabulary already presented.

Between November and June, five samples of oral reading were obtained from all children present during the testing days. These samples were obtained on or about November 20, January 10, March 8, April 11, and June 5.

Test Construction

The passages prepared for oral reading can be thought of as covering two cycles. In the first cycle (November-January-March), one passage was written containing a short paragraph made up of early phonics vocabulary, and a short paragraph using vocabulary from early reading texts. Three versions of these paragraphs were constructed and resulted in Form A, B, and C (see Appendix C-5). Each month, the individual child read a different version.* In addition, at each session, the child read a short paragraph taken from material he had recently covered in his own reading group.

Results of reading the phonically regular passages are discussed in Chapter IV. Qualitative analysis of errors are also dealt with separately in Chapter VIII. Here, we deal with the children's reading performance in terms of what percentage of the "reading" passage was read without error.

Administration

All children were tested individually. Not all passages were attempted by all students, either because of a large number of mistakes on a previous passage, obvious frustration, or length of time taken to read a given passage.

First Cycle

Results on Common Passage. The mean percentage of error of each reading group in each PL school is given in Figures IV and V. The children were counted in a particular reading group if they belonged to that group in June.

Cycle I (Nov. - Jan. - Mar.). Figure IV shows that all groups decreased in errors on familiar material over this period, except for Group I in the Suburban school who made few or no errors from the beginning. The most spectacular decrease in error comes from the less able readers in both classes. Of course, these children had the most room to improve. Some of them were not able to read the passage at all in November.

In the Suburban school, Group I readers have very low error rates to begin with; by January, Group II joined them. Group III is at less than a 05% error rate by January and Group IV reaches the 05% level by March.

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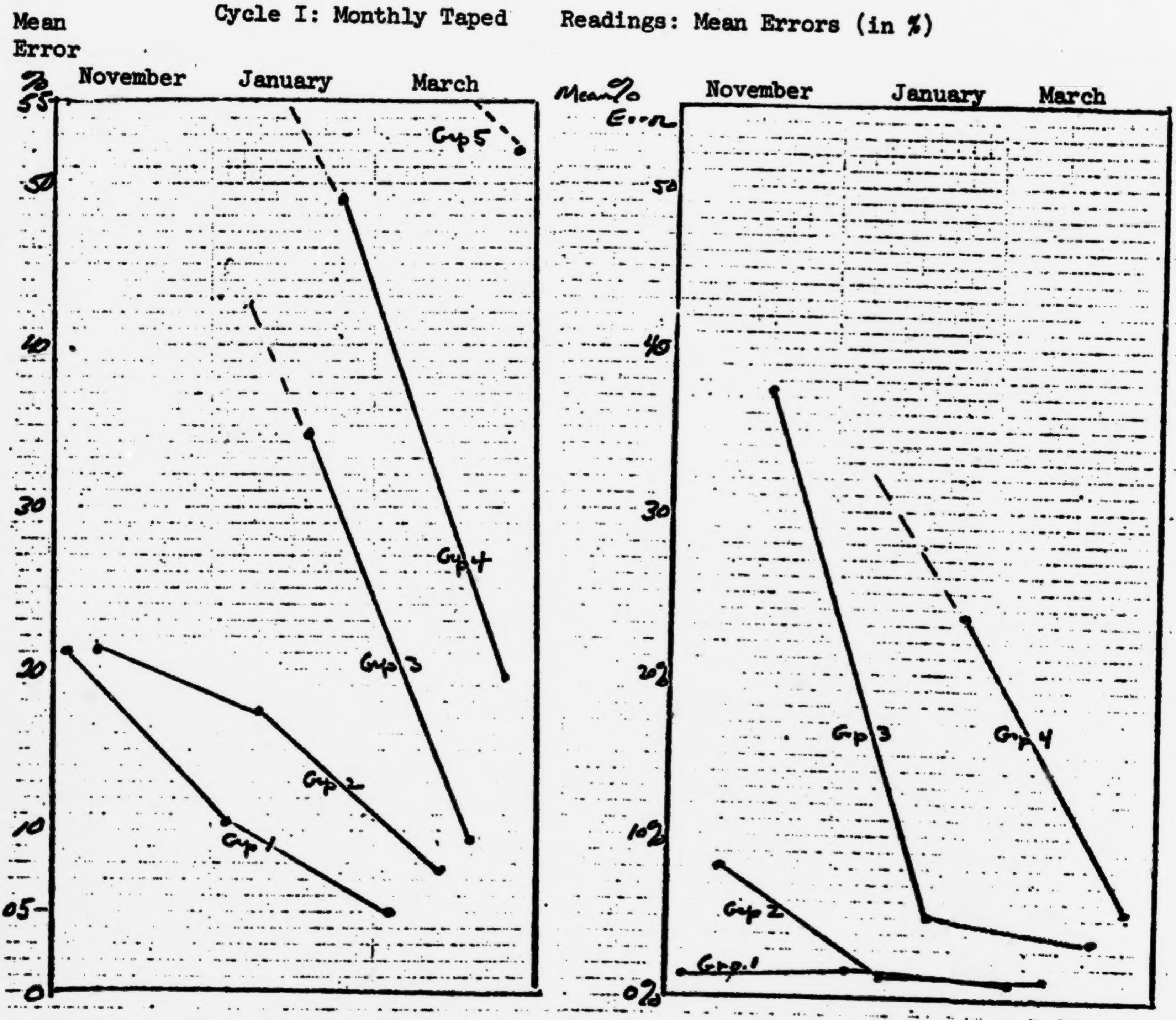
* Actually, children were randomly divided into groups and due to clerical error, read the versions in one of the following orders: AAB, BBC, CCA.

Figure IV

Cycle I: Monthly Taped Readings: Mean Errors (in %)



PL - Rural Class

Group 1. N = 4
2. N = 4
3. N = 5
4. N = 2
5. N = 4

PL - Suburban Class

Group 1. N = 10
2. N = 7
3. N = 3
4. N = 2

Dotted line indicates passage not read

In the Rural school, only the top two groups can attempt the material in November but they are reading with more than 20% error. By March, they, and Group 3 as well, are reading with 0.5% - 10% error. Group 4 in this class was just beginning a formal reading program in January; their performance reflects this fact. By March, they still make more errors than they should, but have improved their performance by almost 30 percentage points. As can be seen, Group 5 (the high risk reading group) attempted to read the material in March but not because we expected they could--only for comparison with others in the class.

Results in Reading Group Paragraphs

Besides the common passage read at each session, additional paragraphs were added each time; these were taken from material recently covered in each reading group. Table 6 gives the mean percent of error by classroom and reading group on these paragraphs.

Table 6

Mean Percent of Error on Reading Paragraphs
November, January, March

	Suburban Class				Rural Class		
	Nov.	Jan.	Mar.		Nov.	Jan.	Mar.
Grp. 1	04.0	05.5	06.0	Grp. 1	22.5	12.2	05.0
2	07.0	12.5	07.5	2	21.0	13.0	14.0
3	05.5	01.1	04.0	3	-	-	15.0
4	33.0	08.5	12.5	4	-	-	33.2

Neither Group 4 in the Suburban class nor Groups 1 and 2 in the Rural class were able to read material independently in November that they were working with in their small groups. These groups improve somewhat as time goes on. The first three groups in the suburban school and Group I in the rural school are reading current instructional material with a low error rate by March. In general, for all groups, there is a decline in error over time.

Second Cycle

In the second cycle (April-June) each child read more than the passage. Five reading passages of increasing difficulty were constructed, and a second version of each passage was written (see Appendix C-6). Half the children read one version in April and the other in June. The other half reversed the procedure.

Readability scores were computed (Spache's formula) for these passages. Note that Passage 5 seems much more difficult than the rest and Passages 1& 2 seem comparable to each other as do Passages 3 & 4. We will see that calculation of children's errors suggests a much greater spread in difficulty of the passages than do the readability figures.

Table 7

Readability Measures on Passages

Passage	April	June
1	2.80	2.43
2	2.86	2.78
3	3.56	3.89
4	3.35	3.26
5	5.89	5.60

Figure V shows how each reading group performed on each passage of increasing difficulty in April and again in June. Some reading groups were stopped before reading the hardest passages, and in June some reading groups were allowed to omit the easiest passage.

Ideally, error rates should go down from April to June but each more difficult passage should show some increase in error in both months. This did happen but not consistently for all passages and for all reading groups. The most noticeable discrepancy is for Passage 3, which in April seems easier than Passage 2 for some of the groups, whereas errors on its alternate form in June is in the expected direction. These error differences for Passage 3 proved not to be significantly different statistically.

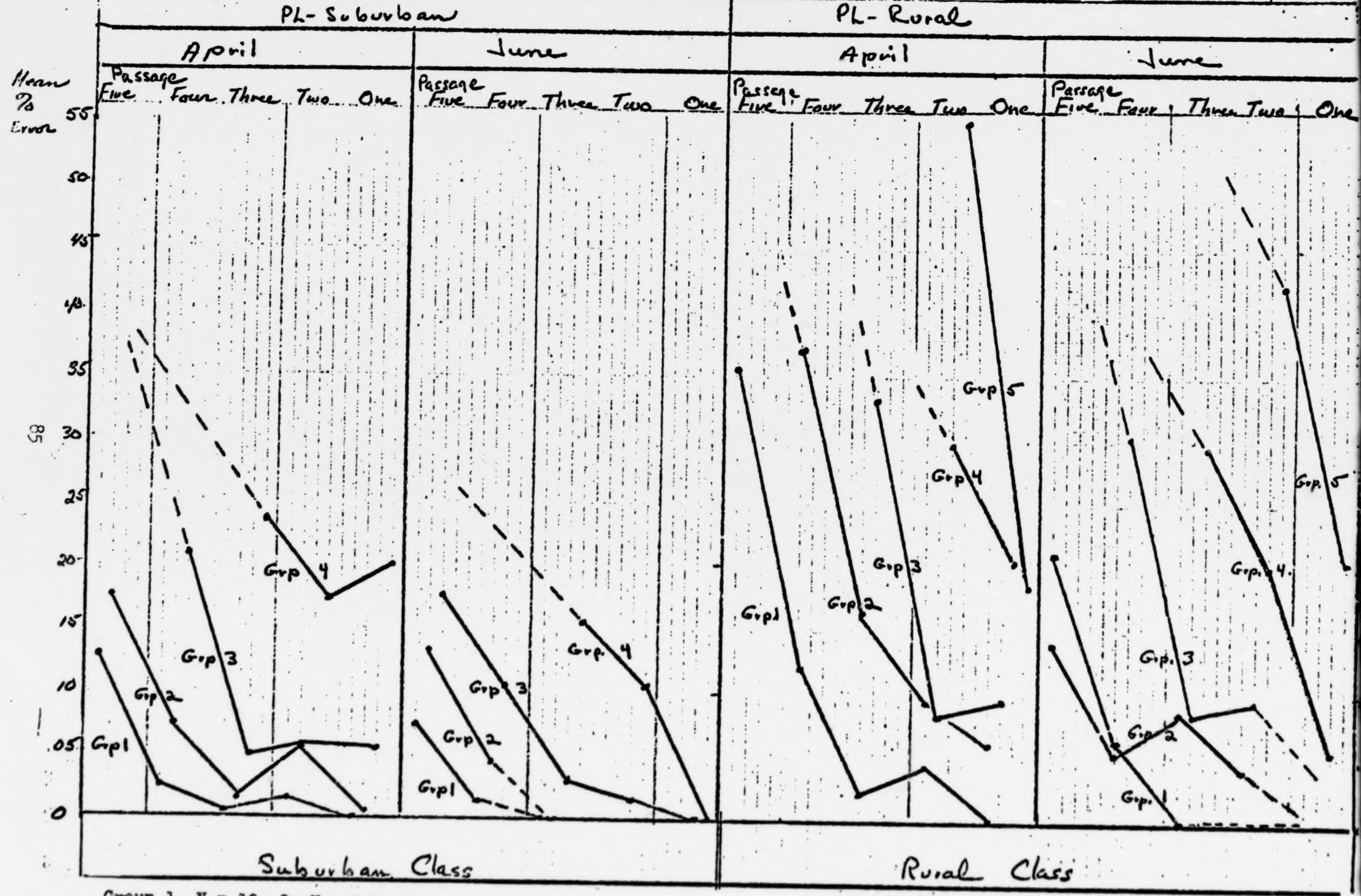
Comparing percentage of error for each class in April and then in June, the error rates go down for each group in both classrooms (see Figure IV).

Results: Suburban School. Group 4 in the Suburban class is able in June to read easy material (Passage 1) with no error at all, a spectacular improvement on their 20% mean error at this level in April. In June, Groups 1 and 2 in the Suburban class (20 out of 24 children) can read difficult material (Passage 4) with an error rate of less than 05%.

Results: Rural School. In the Rural class, Groups 4 and 5 show the most improvement. It will be remembered that Group 5, the high risk reading group, barely appeared (with a 52% error) on Figure IV, which graphed errors during the first cycle. The children in Group 5 are still not reading first grade material in June with anything resembling mastery, but Figure V shows what gains they

Figure V

Cycle II: Monthly Oral Reading Passages



Group 1. N = 10; 2. N = 10; 3. N = 3; 4. N = 2

Group 1. N = 4; 2. N = 4; 3. N = 5; 4. N = 3; 5. N = 4 have made in terms of their own performance in September. By June, Group 4 in this class is reading easy first grade material with a low error rate (05.5%) and the top three groups can read through Passage 3 with errors from 0% - 10%. The two top groups in the Rural school are even reading the relatively difficult Passage 4 with a low (05% - 06%) error rate.

Figure V also gives some indication of the relative reading proficiency of the various reading groups and suggests that the children had probably been grouped together according to real differences, since rarely do the error rates for different groups on a passage overlap; and as passages get more difficult, the error rates rise more sharply for the less able readers.

Summary

The taped oral reading helped us during the year to choose appropriate material for individual children. The findings on the reading groups, as reported here, seem to indicate that the children were learning to read more and more complex material as the year went on, and that although different groups had different rates of progress, all children were gaining in their ability to handle a wide variety of texts.

June Oral Reading Test, Six Classrooms

Four reading passages were devised for comparing the oral reading performance of the PL classes with the two non-PL first grade classes in each school. No such comparison was done the first year.

Passages

In writing these passages, a vocabulary pool was obtained by listing all words from the Scott-Foresman pre-primers and eliminating those words which had not occurred in the PL early reading materials (see Appendix C-7 for word lists and passages). Thus, the easiest passage, Passage 1 (66 words) used only vocabulary common to both pre-primers; the next passage (73 words) used about 80% common vocabulary; the remaining two passages had about 58% and 35% common vocabulary, and 96 and 95 words, respectively. Passage IV was made up of a paragraph from the Scott-Foresman 2^2 basal, and a paragraph from their 3^2 basal. Where proportion of unknown to known words could not be kept constant for PL and non-PL classes, the passages contained a higher percentage of unknown words for the PL classes. The resulting four passages were meant to increase in difficulty, but by how much in each case we had no way of knowing prior to testing. In this respect and others, the ability to read each succeeding passage would be but a rough approximation of achievement. For example, the percentage of words included in each passage that were not common to the pre-primer level could have occurred in later reading in first grade. Further, it was not possible to compile a completely accurate list of words presented early in the PL program because of the very nature of the program. Lastly, the implied assumption that only words presented by the teacher in an instructional setting are appropriate to an ability level is patently false--and the better the reader, the more false the assumption. But with all these limitations, the procedure used to produce the test passages yielded results in the expected order of difficulty. (Figure VI compares error rate of all 93 children on each of the passages.)

Sampling

All children in the PL classes were tested. Half the boys and half the girls in each reading group in the other four classrooms were randomly chosen. Since the first grades in the rural school were grouped homogeneously, with the PL class having the lowest academic expectations, the other two classes tested will be referred to as VG-Rural (very good expectations) and Avg-Rural (average expectations). In the suburban school all three classes, including the PL class, were grouped heterogeneously. These classes will be referred to as PL-Suburban, S-Suburban, and H-Suburban.

Administration

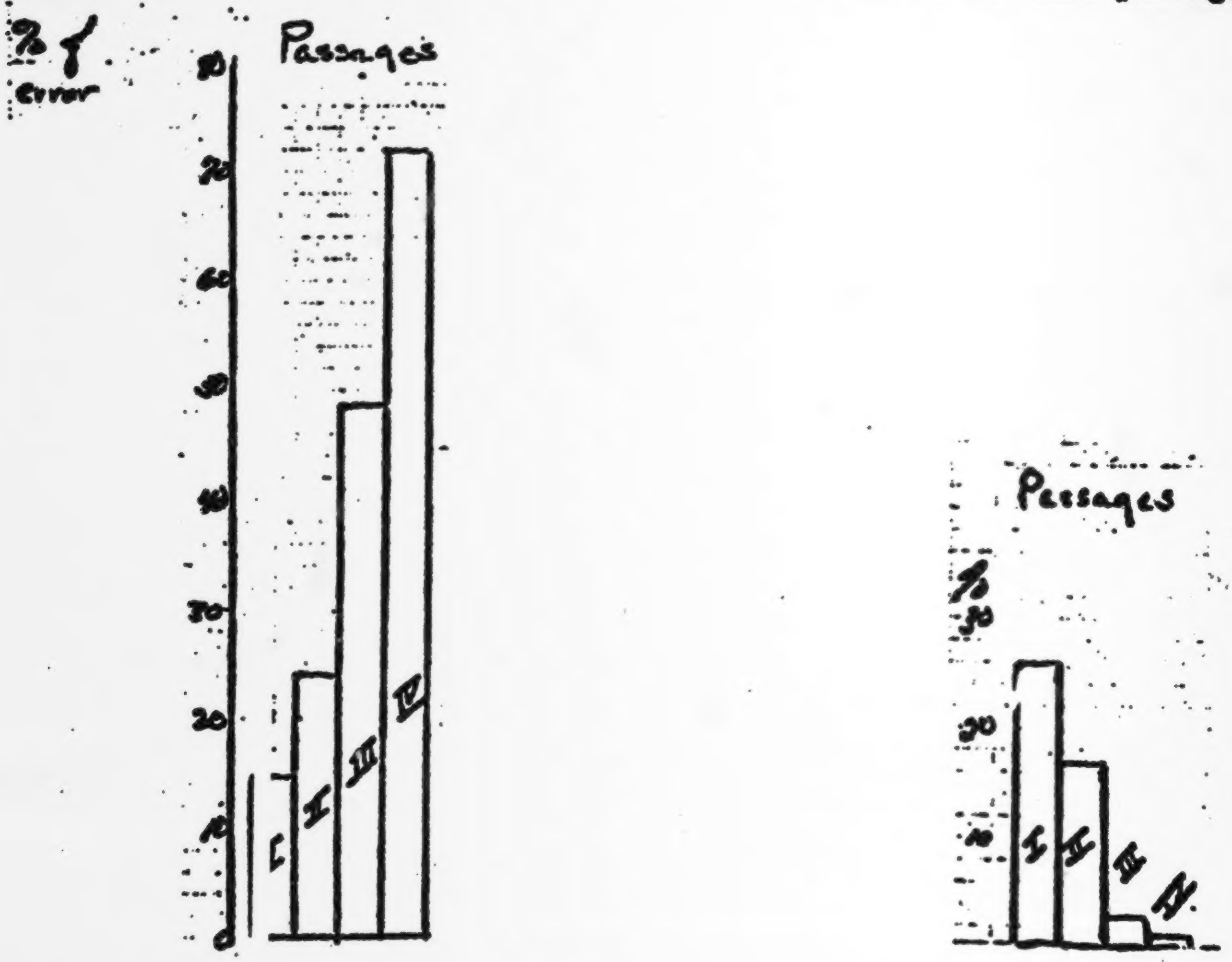
Two examiners, one for each school, taped the oral reading of each student individually. When errors reached a 10%-12% level, the student was stopped at the end of that passage; if errors greatly exceeded this level, the examiner stopped the student before the end of a passage and read the rest of it to him. When this last happened, the passage was not counted as having been read at all. In a few cases the examiner mistakenly allowed a child to go on to the next passage when he had made more than a 12% error on the easier one. In these cases, no matter what the subsequent scores were, the following passage(s) was not counted as having been read. This was done to equalize the procedure for all children.

Results

Frequency and Percentage of Error. Figure VI shows that the passages did indeed increase in difficulty and discriminate among the readers. Table 8 gives the mean number of errors made by the children in each class who completed a particular passage. Among the two classes showing low performance, the PL rural class was theoretically less able than the Avg-Rural class, but performed with fewer errors and read more passages. The fact that the PL-Rural children were able to bring their performance up toward the level of higher rated groups is encouraging.

Figure VI

Reading Testing


Student = (in %) making more than 25% error or who didn't read passage

Student (in %) making no errors in each passage

Table 8

Mean Error on Each Passage
and Percent Reading Each Passage

		Passage 1 66 words		Passage 2 73 words		Passage 3 96 words		Passage 4 95 words	
Group	N	% Rdg.	$\bar{X}$	% Rdg.	$\bar{X}$	% Rdg.	$\bar{X}$	% Rdg.	$\bar{X}$
PL-Suburban	24	96	1.5	96	1.6	88	10.7	46	6.2
S-Suburban	13	92	1.8	92	3.7	62	4.4	54	6.6
H-Suburban	12	100	2.8	83	2.6	83	14.1	33	8.8
VG-Rural	13	100	1.5	100	2.3	69	9.6	31	4.8
Avg-Rural	12	83	8.4	42	9.8	0		0	
PL-Rural	19	63	7.6	63	7.2	11	12.0	0	

There are few differences among the four "good" classes, but their mean error is far lower than the Average or PL-Rural scores. Figure VI and Table 8 taken together indicate large differences in error rate from one passage to the next and in the number of students reading each passage. For example, in Table 8, mean error tends to go down on Passage 4 as compared to Passage 3, but so does percentage of those able to read this passage. Perhaps a better way of looking at the results is to group together those who read all four passages, those who read three, and so on. When this is done (see Appendix C-8, for detailed results), the mean percent on all passages of total words read correctly is as follows:

Those reading only Passage 1	80% correct
Those reading Passages 1, 2,	92%
Those reading Passages 1, 2, 3,	92%
Those reading Passages 1, 2, 3, 4	96%

These percentages show the results of stopping a child when error increases. Those who read only Passage 1 made one error for every five or six words, and were not allowed to continue. When two passages were read, there was in almost all casea a rise in error on the second passage. All but one child reading three passages show a drop in performance at the third passage. Those who read all four passages, however, could probably have gone on to more difficult material (Passage 4 is considered to be at Grade 3 level). So the fourth passage did not provide a ceiling; nevertheless the children who could read Passage 4 are clearly the most advanced readers of those tested and do form a separate group.

The mean percentage correct, then, indicates a rough level of achievement for the children who could read at each level. Thus, comparison of the reading ability of the children can be made by looking at the relative number of children who were able to advance through the passage. Table 9 gives these figures.

Table 9

Percent of Each Group Completing 1, 2, 3, 4 Passages

Group	N.	Passage 1 Not Comp.	Comp.	Passage 1,2	Passage 1,2,3	Passage 1,2,3,4
PL-Suburban	24	04	96	96	88	46
S-Suburban	13	07	92	92	61	54
H-Suburban	12	0	100	83	83	33
VG-Rural	13	0	100	100	69	31
Avg.-Rural	12	16	84	42	0	0
PL-Rural	19	37	63	42	11	0

In the PL-Suburban class, 88% of the children could read beyond Passage 2, and 83% of the H-Suburban children could. Only 33% of the H-Suburban class, however, read Passage 4 while 46% of the PL students read this last passage. Similarly, more than half of the S-Suburban children read the last passage but a large part of that class (39%) were stopped at Passage 2. We can see from Table 9 that the PL-Suburban class compares favorably with other groups of similar background and ability.

Comparing the lower achieving classes, clearly the 37% (seven children) in the PL-Rural class who couldn't complete (or completed with 25% or more error) Passage 1, contribute most to the lowest end of the scale. Five of these seven children were in the special high risk reading program and were working on pre-reading skills for most of the year. Their poor showing on this task was not unexpected. The PL-Rural class as a whole, however, shows more spread than the Avg-Rural class, with several PL children reading the more difficult third passage.

Chapter IV

The Sound-Spelling Correspondence Program

Part 1 - Rationale and Content

Instruction in the regular correspondences between letters and sounds was intended to complement other forms of instruction (rather than take precedence over them). Anticipating the bulk of material that the children would face, we wished we could present all the letters and sounds at once. As a realistic alternative, we chose to present those generalizations powerful enough to help children carry out the actual reading task, and to illustrate the alphabetic nature of the writing system from the very beginning.

Rationale, Content, and Sequence

In the second summer seminar, a sub-group met to review the phonics program of the first year.* Their purpose was to work out a more detailed sequence for the presentation of the correspondences within the framework of an explicit rationale. At the end of the seminar, this group had specified the correspondences to be taught as well as the "concepts" that certain correspondences exemplify.

Rationale

The three criteria that influenced the sequence of presentation were productivity, contrast, and generality.

Productivity. The major basis of choice in determining order of presentation given the limitations of word types was productivity. Here, productivity of a sound-letter correspondence means not only its frequency in a vocabulary list, or frequency of the words in sentences, but also the possibility of combining a given correspondence with one presented earlier in the program. Thus, n is presented early because it occurs frequently in the language, but wh is presented relatively early too, because it occurs in a small set of highly frequent English words.

The working procedure for testing productivity was to list all the possible words that could be formed with those correspondences that had been presented up to a given stage. The result influenced sequencing. For example, the introduction of the useful plural/third person singular *-s* was postponed until after four consonant and four vowel sounds were presented. Our lists had shown that before the introduction of the long vowel values, the addition of *-s* generated only four new words, but when introduced after the long vowels, *-s* formed eleven new words.

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* See First Grade Report, 1965-1966, for detailed discussion of the first year's Correspondence Program. This chapter deals only with such sections as were incorporated into the final program.

Contrast. Two kinds of contrast affected our choice of the earliest correspondences in the sequence: visual contrast, and auditory-articulatory contrast. That is, correspondences must differ considerably in how they looked and how they were produced. For example, the first three consonants to be introduced, *m*, *s*, and d differ as sounds in at least two of the articulatory features of 1) manner of production, 2) place of articulation, and 3) voicing. As letters, their graphic forms are also quite different. We thought that these letters, combined with *a* would provide a highly contrasting set, and help facilitate the discrimination task for beginners.

Generalization. The writing system is more than a set of individual letters that relate one-to-one with a set of sounds. Generalizations about how the writing system operates, that is to say, refinements to the basic generalization that a letter represents a sound, comprised another aspect of the program. The first three are general throughout the system. They were considered so important that the teacher was asked to make them explicit in her instructional language to the class. They are:

1. Letters stand for sounds.
2. Letters, like sounds, occur in different positions of a word.
3. The order of the letters and sounds is significant to the identity of a word.

A concept also present from the beginning, but not made explicit is:

4. Vowels (letters and sounds) are phonetically and distributionally different from consonants, e.g., only a vowel would fit in the frame s_t.

Soon after the introduction of the first three concepts the following qualifications are made:

5. A letter can stand for more than one sound, e.g., the *a* in *mat*, *mate*.
6. Another letter may mark the appropriate corresponding sound of a given letter, although it does not stand for a sound itself, e.g., *-e*, in *mate*.

Although the last two concepts could be applied not only to letter patterns such as *a* and -e in *mate*, but also to *ch* and *sh*, where the *h* may be said to mark the *s* and *c*, it was decided that contiguous letters operating as units in spelling patterns and relating only to one sound would be taught more profitably through the following:

7. A combination of two letters may stand for one sound, e.g., ch, and sh.

Patterning in the graphic system alone, with no significance for the corresponding sound system, is established through examples showing that:

8. Depending on the position in a word, a sound may be represented in more than one way, e.g., initial ch- and final -tch.

The sequence of the eight concepts listed above, taken together, set another limitation on the sequencing of the correspondences themselves.

Content

The correspondences selected for presentation were:

1. The vowel letters and their corresponding short sounds.
2. The vowel letters marked by -e, i.e., their corresponding long sounds.
3. All of the consonant letters and at least one frequent corresponding sound.
4. Several positional spelling variants of the consonants, e.g., initial ch, and final ch or -tch.
5. Frequent spelling units composed of more than one letter, e.g., th.
6. Frequent consonant sound-letter clusters, e.g., initial fl, and final nt.
7. Inflectional endings -s, -es, -ed, -ing, -er.

All letters were to be presented in most positions with at least one sound value. Of the vowels, only two values were explicitly presented--short and long.*

We did not expect an average first grader to cover this much material; we prepared for a fast moving class.

It is clear that many of the decisions on content, and the priority we had given to some of the generalizations, anticipated methods of classroom presentation. In accordance with our stated aims we decided that:

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* The traditional terms "long vowel" and "short vowel" as used in this report do not imply difference in duration. Most readers can more quickly identify the sound referred to than if, say, the terms "free" and "checked" were used.

1. Since learning of correspondences involves associating letters with sounds, practice in the discrimination of sounds and the discrimination of letters would accompany the introduction of a given correspondence lesson. Learning of letter names would, however, precede the correspondence program.

2. Whole words were to be used to demonstrate similarities and contrasts. Isolating the sounds was not thought to be necessary. By choosing real words, we hoped to stay close to the main task of reading.

3. Except for the group of correspondences at the beginning of the program, new words were to be build by adding to previously presented letters. In this way, the children would see and be expected to handle only words in which the correspondences were already familiar. Thus, p would not be presented in the word pot at a point where o had not yet been introduced.

4. The restriction to words with familiar correspondences required inclusion of vowel correspondences from the outset, and the addition of other vowel letters and values early in the program.

5. The words chosen to exemplify the letter-sound regularities were monosyllabic (i.e., having one vowel) except for disyllabic inflected forms (e.g., dishes) and expansions of previously presented monosyllables (matter).

6. Useful words not following regular patterns would be presented in other parts of the reading program and not formally analyzed. There are irregularities in the writing system--words showing deviation from the usual pattern. They should be presented as such, that is, none and put would be shown when such words as bone and but appeared in the program, but they would be learned as separate entities and not as members of a set.

7. Words would be presented both in isolation and in sentences. In line with this aim, we planned to provide exercises in which words, already presented, would be seen immediately in sentences, along with other frequent words taught as wholes, e.g., the, are, thus demonstrating to the children that correspondence rules can be used as part of an overall strategy for reading long stretches of print.

8. Many concepts would be presented early. Standards of mastery might be low initially, but the same concepts would constantly recur and be reviewed. Each lesson would provide review of previously learned concepts; word-building and letter substitution exercises would include all sound-letter correspondences that had been introduced up to that point. The children should see the inventory of words expanding with the addition of each new letter.

(Our primary criterion for choosing a sound-letter relationship at a given point, that is, its productivity, reflects just what we wanted the children to learn--that there is an invariant relationship between the writing and sound system for most of the letters and letter patterns in the language. To illustrate this point we planned exercises in which the child would substitute a letter in a word, e.g., sad, to make another word, sat, then substitute still another letter to make a new word, sit.)

9. Provisions for informal testing and more detailed subroutines would be supplied during the teaching phase.

Sequence

Taking into account all the constraints described so far, a sequence of presentation was worked out. Figure VII shows the chart used as a guide in writing lesson plans. In the Figure, Column I gives the specific sequence of letter-sound correspondences to be taught. Column II provides the rationale for choosing these letters, and Column III gives the actual sequence of the lessons in the order they were taught.

Figure VII

Sequence

I Letter-sound Correspondences	II Rationale	III Lesson Number
d m s a Letters stand for sounds. Here each letter stands for one sound. Letters, like sounds, occur in different positions of a word. Order is significant. Not explicit: Vowels are phonetically & distributionally different. E.g., only vowels fit in the frame s_t.	Letters chosen for: graphic contrast phonetic contrast productivity (high frequency in first grade words and combinability with concurrently presented inventory) (N.B. Working notions: word sentence beginning and end)	1. d,s with short a 2. d,s,m with short a 3. d,m

Figure VII (Continued)

I Letter-sound Correspondences	II Rationale	III Lesson Number
t	Regularity and productivity in previous pattern.	4. t
i	Productivity	5. short i with d,s,m, t
-e as a marker for a & i A letter can stand for more than one sound. Another letter may signal the appropriate sound. The marking letter does not stand for a sound itself.	Productivity of pattern and concept. NB - medial e is not introduced early because it is not productive, especially in -eCe pattern.	6. long a,i
Morphological endings -s in sits, hats	Plurality and 3rd sing. pres. are represented by -s. Teacher ignores s/z distinction in sound. Presented in context, e.g., 1. mat; 2. mats.	7. plurals verb agreement
n	Regularity, and productivity, especially in final position and with marker- e in - VCe pattern.	9. n in initial position
sh A combination of two letters may stand for one sound.	Productivity NB. h has not been introduced alone. The combination sh does not occur with marker -e.	10. sh in initial & final position 8c. Discrim. bet. sh & ch 8d. s & sh 8e. wh & sh

Figure VII (Continued)

I Letter-sound Correspondences	II Rationale	III Lesson Number
Morphological -es dishes, dashes	Usefulness. This presents the other spelled form of plural and 3rd sing. pres.	(See Lesson 7. -s & -es taught together)
p	Productivity, especially with marker -e. Review of earlier concepts. At this point, standards of mastery of old material are high. Regular new letters should be assimilated quickly.	11. p in initial position with short a 8a. b & p 8b. f & p
Morphological endings -ing, -er.	Productive in forming disyllabic words.	12. ed, ing
Disyllabic words. Familiar letter-sound patterns occur in longer words.	Teacher only examplifies this concept by presenting words. Children are not expected to read them, but to recognize partial identity with familiar words.	13. disyllabic words. Familiar patterns in longer words
o -oCe	Productivity	14. o in medial position 15. o contrast with a,i 16. long o
ch- -tch Pairs of this type are positional graphic variants of one sound.	Productivity (tch only with short vowels). At this point, present other positional variants, in monosyllabic words, e.g. miss, sit	17. ch in initial position with short a,i,o 18. ch in init. position with long a,i,o 19. -tch with short a,i 8c. sh & ch 8f. wh & ch 8j. th & ch

Figures VII (Continued)

I Letter-sound Correspondences	II Rationale	III Lesson Number
wh-	Not productive in terms of this inventory, but important because of its occurrence in a small number highly frequent words.	20. wh with short a,o 8e. wh & sh 8f. wh & ch 8g. s & f 8h. th & f
-ss	Productivity	21. -ss with short a,i,o
f -ff u	Productivity	22. f with short u
b	Productivity	23. b 8a. b & d b & p
h-	Productivity	23. h 8a. h & th 8l. h & f
th (voiceless)	Not high productive, but regular. N.B. Voiced th is not specifically taught, since it appears in common functions words. -the as in bathe is not presented.	23. th 8h. th & f 8n. th & sh 8j. th & ch 8k. h & th
-y	Productivity in final position especially in the pattern -VC, C,y and -VC, y. taffy pony daddy baby Bobby shady Sammy tiny	*

* Suggested in outline but not included in actual lessons.

Figure VII (Continued)

I Letter-sound Correspondences	II Rationale	III Lesson Number
More disyllabic words	Long words, other than those ending in -y, which begin with familiar patterns are presented. Children expected to identify stretches in addition to recognizing that they are familiar. chatter fantastic chipmunk battle chimney bottle	*
-u- uCe	Productivity. Few words in expanded inventory require /yuw/ instead /uw/, e.g. mute. Teacher does not make a point of them.	24. long u
-ng	Productive	24. long u with ng
More disyllabics	No distinction is pointed out between occurrence of /g/ in finger but not in singer.	*
l- in initial position only	Productive. Final -l postponed because of effect on preceding vowels, e.g. fall, pull.	8L. l & r 8m. l & w
r- in initial position only	Productive, but -r postponed for same reason as -l.	8L. l & r

* Suggested in outline but not included in actual lessons.

Figure VII (Continued)

Initial clusters of familiar letters with l and r. sl, dr, tr, shr, pr, pl, fr, fl, br, bl	Productive	25. Cons. blends with l,r 26. Blends: p,f, b with l 27. pl, fl, bl with long a, i,o,u 28. Blends with r
More disyllabics	Productive	*
-e- and -ee-	Short -e is productive in the inventory at this point. Since -eCe is not, -ee- is introduced as the long counterpart.	29. short e 30. ee
final consonant clusters -nt, -st, -sk, -ft.	Productive, especially with -e-.	31. final cons. clusters nt, st, nd, ft
w-	Regular, wa- ignored here.	32. w 8m. l & w
-ck	Productive and regular	33. -ck
c-, k-	Only "hard" /k/ value given, since /s/ and /j/ not productive. Taught together.	8n. k & c (visual) 8o. k & g
-ke	Productive with long vowels.	34. -ke
-g	Only /g/ value. -ge and	(see lesson 8o above)
-x v- ve y- z- -zz qu- j-	Presented in order to provide at least one value for each letter.	35. x in final position v in initial position -ve in final position 36. y,z,zz,ze, qu,j

*Suggested in outline but not included in actual lessons.

Not included: Vowels before -l and -r; Vowel digraphs (except ee); "Soft" c and g; Many uncommon correspondences, e.g. "ch"=/k/; Derivational suffixes; Many consonant clusters.

Plan of the Lessons

All of the correspondence lessons followed a general plan. A manual was prepared in which each page was divided into two columns. One column was labeled "Teaching Procedures" and contained a step by step presentation of each lesson. The other column was labeled "Notes to Teacher;" it explained and clarified the concepts to be taught in the lesson. A description of the accompanying worksheets, and instructions as to their presentation and purpose was also included under the "Notes" column.

Lessons

Generally, each lesson was divided into five steps: visual presentation of the correspondence; auditory discrimination; word-building; sentence reading; and review (or re-cycling). The following is an example of an early lesson.

Step I

1. Pupils see two pictures with the words dad and sad written underneath.
2. (The teacher points to both words) "Are these words the same?"
3. (She points to the beginning letters) "Are they the same at the beginning?"
4. (She points to the final letters) "Are they the same at the end?"
5. (She points to d and then to s) "Do they have the same letters at the beginning?"
6. "What is the name of the letter dad begins with? sad begins with? (Ends with?)

Step II Auditory Discrimination. The teacher says, "Let's listen to the sounds of these words." She asks:

1. Do they sound the same?
2. Do they sound the same at the beginning?
3. Do they sound the same at the end?
4. Do they sound the same in the middle? (When vowels are being analyzed.)

Step III Word Building. Pupils change initial or final consonants, or vowels, to form new words. For example, the teacher writes mat on board, erases the m, substitutes s, and asks "What new word did I write?" Then, she erases the t in sat and asks the pupils what letter is needed for the word sad. A pupil then changes the letter on the board.

As a variation on this type of practice, write "_at" on the board and have the pupils supply the appropriate initial consonant from a list of words that follow a particular pattern (mat, sat, bat, etc.).

Step IV Sentences. Reading the words in context and producing them independently. For example: Dad is ___ (sat sad). Individual children select and write the correct answer.

Step V Recycling. The teacher goes over Steps I & II when necessary (visual and auditory discrimination) to provide extra practice on previously presented letters.

Worksheets

Worksheets were written to accompany every lesson. Instructions for their use were included in the "Notes to Teacher" section of the teacher's manual.

Most of the worksheets fall into the following categories:

1. Consonants (single consonants, blends, digraphs)
    a. substitution in initial or final position
    b. fill-in (supply missing letters) in initial or final position
    c. association of letters or words with pictures
    d. addition or deletion of letters
    e. recognition of consonant differences in word pairs
    f. word building (word families)
    g. doubling final consonants
    h. matching like words

2. Vowels (short and long)
    a. fill in
    b. substitution
    c. matching words with pictures
    d. recognition of medial likenesses and differences

3. Sentences
    a. Sentence completion (developing sentence sense)
    b. matching sentence to a picture
    c. definitions: matching word to meaning
    d. "silly sentences" (change to make sense)
    e. reading sentence and following instructions

4. Rhyming
    a. matching to pictures
    b. matching words
    c. letter fill-in

5. Morphology
    a. Adding suffixes (-ing, -ed)
    b. forming plurals
    c. doubling final consonants before adding suffixes
    d. dropping final -e before adding suffix

6. Cross word puzzles

Part II - Teaching Procedures

The Beginning Lessons

Formal lessons began in the suburban school on September 26. By Lesson 3, we already saw things to change. It was evident that the steps in the lessons covered too much ground for some children; that worksheets following the lessons should contain only one kind of task--not several different tasks; and that some children (about half) needed more practice in listening to and comparing beginning and ending sounds in words.

Since the actual lesson plans and worksheets were still in the process of being written, provisions could be made for smaller steps and simplified worksheets in future lessons. The auditory discrimination problem was more difficult to solve.

Auditory Discrimination

Because the earliest letters introduced in the correspondence lessons were chosen, in part, for their equal articulatory and acoustic distance from one another, we had not planned to give the children separate practice in hearing differences among the sounds. But both teachers felt the lack of a more concentrated auditory discrimination program. Consonants were not introduced early enough in the Correspondence program, to keep up with the rate of words encountered in the regular reading program. More sound-letter discrimination training was needed earlier to allow pupils to use phonic cues to figure out the sounds of initial consonants when reading new words. This lack was important enough not to be overcome by incidental teaching only.

Lessons were written, beginning with Lesson 8, to tackle this problem. All future discrimination lessons were called Lesson 8's (8a, 8b, etc.). There were about a dozen of them, in all, before the year was over. The Lesson 8's were considered "floating" lessons, to be inserted for extra practice in auditory-visual discrimination when needed, and were intended to be used at a much faster rate than the regular phonics lessons, thereby familiarizing the children with consonants several days in advance of their introduction and analysis in a correspondence lesson.

Initial Teaching

Suburban Class. The first few lessons were introduced to the whole group, and concepts were reviewed as part of the work with reading groups. It was soon decided to continue to introduce new concepts to the whole class but to discontinue whole class review because attention data showed the brightest students to be bored during the review lessons. These whole class review lessons were both too fast and too slow for different segments of the class. Therefore, the small group work on Tuesday and Thursday was given over to phonics. Very soon, it was impossible to introduce even new lessons to the whole class, since students were moving at very different rates in their small groups.

A child was placed in a particular group as the result of an informal test in which each student in Reading Group 1 was asked to read a list of "phonically regular" words from previous *PL* lessons. Transfer was tested by including in the list three new words that followed the same pattern as those that had already been presented. The test for the rest of the class was a teaching-testing one. Those placed in Group II could change e.g., *sam* to *same* after reviewing *mad-made*; those placed in Group III could not. The groups remained fairly constant throughout the year, with the exception of a few shifts from Group II to Group I, and Group III to Group II.

Tactics for all groups included building words by substituting letters; making simple sentences using the vocabulary they had been practicing; and permuting these sentences to other sentences.

By November 9, after eight weeks of school (see Chapter III for parallel progress in reading), Groups I and II had covered almost the same material, with Group I a step or two ahead of Group II. The two groups were on Lesson 6 of the *PL* program. They were comparing long and short *a* and *i* in the context of the now familiar *d*, *s*, *m*, *t*. Group III was moving more slowly. They were working with short *a* and *i* words and the same small set of consonants--Lesson 3 in the *PL* program.

Rural Class. In the rural school, conversely, the whole class procedures provided exposure that all children needed even though some children could not contribute beyond the initial steps of any given lesson. Full class lessons included auditory and visual discrimination of sound-letter pairs, and the use of the Michigan Successive Discrimination Program. The Michigan materials require pupils to match letters, and listen for similarities and differences in sentences, phrases, and words.

The small groups in the rural school, then, were used to reinforce parts of lessons taught to the full group or to review and give needed drill on concepts already introduced. Time in groups was spent on such tasks as:

1. Letter-naming--following the suggestion in *Sullivan Pre-Reading Program* of grouping the letters thus: ABCDEZ; FGHIJY; KLMNOPX, etc. By Nov. 9, children in Groups I, II, and III had practiced these three sets but Group IV was still working on the first set.

2. Listening for initial sounds in words (n, d, s, m, t), and deciding whether two words began with the same sound or not. The children found pictures in magazines and made their own picture books of words beginning with d, s, m, t.

3. Hearing rhyming words.

4. Visually matching letters and words. It had taken several weeks to teach the children in the rural school what a matching task was and that small perceptual differences do matter. They had moved from learning to match like shapes without error (presented merely to teach the task), to working with matching letters. That rotations and reversals make a letter different was a hard concept for them to see at first. As of October 20, the observer notes, "Same-different dittoes with single letter discrimination are too easy now."

But they still needed more visual discrimination practice. The class began to try "oddity" dittoes, i.e., "Which one is not like the display" and started to match on the basis of more than one letter.

On November 1, Group I began the PL program, and by November 9 this group was working on Lesson 2, comparing words like dad with sad, and sam with sad in simple sentences. On November 16, Group II began the PL program, and on November 29, Group III did, too.

At this time, Group IV (four children in the high risk reading program) was doing alphabet work, rhyming, sound-letter correspondence of s, m, d, and substituting initial and medial letters in three or four "known" words. For all but Group IV, the Sullivan pre-reading lessons, giving practice in these same discriminations, was used. Both the PL program and the Sullivan materials seemed to complement each other.

Pacing of the Lessons

It was soon evident that we had indeed planned a program for average and above average children. For example, at the suburban school, Lesson 1 took Group I one day; Group II two days; and Group III, three days. At the rural school, for the same lesson, Groups I and II took three days; and Group III five days. Since the lessons were given only twice a week, the slower moving groups might take as long as two weeks or more on one lesson.

During this period, the rural teacher frequently used each step of a lesson as one day's work. She felt the program was written to move too quickly from one concept to the next for her class, so she provided extra review and evaluation after each step. Even for Group I, the rural teacher often spent several days on a lesson.

One reason for the slower pace in the rural class was the need to teach for position of a letter as well as its sound value. A letter-sound that was recognized in initial position still needed a great deal of exposure in final position before being correctly identified. Another source of trouble was poor auditory discrimination, especially of final vowel-consonant sounds. Besides the Lesson 8's, special sub-routines were written to attack these problems. The sub-routines will be discussed later in this chapter.

Progress Through Lesson 5. Time per lesson, of course, influences progress through the sequence. An indication of the different aptitudes can be seen when time taken to complete the first five lessons is compared for the two classes.

Group	Suburban	Rural
I	October	December
II	"	January
III	"	February

Lessons 1-5 covered the consonants: d, s, m, t in combination with the vowels a, i, in their short value. Various combinations of these letters produce about 17 CVC words, only some of which had been practiced. The suburban class had been taught these lessons in full group sessions with varying results as the grouping test, mentioned earlier, shows. The groups in the rural school moved at a much slower pace through these very important first lessons.

Ability to compare long and short vowels

The heart of the program was the work with vowels. After introducing short a and i and then comparing them, the long vowels a and i were introduced together in Lesson 6. A check on oral responses of the children when this lesson was presented shows how difficult the comparison was. In the percentages given below, compare the correct oral responses in Lesson 6 with those for the previous lesson.

	Lesson 5 (short i)		Lesson 6 (long a and i with e as marker)	
Gp.	Suburban	Rural	Suburban	Rural
I	98%	68%	89%	73%
II	84%	86%	73%	61%
III	80%	67%	58%	(no data)*

* Although there was no observation of Group III's oral performance on Lesson 6, there was an observation on Lesson 7, a lesson that reviews the long vowel comparison. Their responses were correct 25% of the time on Lesson 7.

It is clear that the long a and i lessons were particularly for the children, and it took a lot of review and recycling to clear up the confusion. We decided we had over-taught the response to short a and i. In addition, the teachers thought it was a mistake to attempt to teach long a and i simultaneously (We agreed!), and that extra lessons were needed to contrast the long and short values of each letter separately prior to attempted contrast and comparisonoof long a and i. We had tried to do too much too fast. Since we were still writing the future lessons, we were able to recast the introduction of the remaining vowels.

For the rural school children, the teacher and staff felt that the vowel sounds needed to be isolated visually and auditorally, although our original plan had been to present and teach all correspondences within the context of real words. The teacher used her own techniques for isolating individual sounds of vowels, particularly long vowels. This method was never incorporated into the correspondence lesson plans, but could easily be used by any teacher who felt that a particular class needed this extra cueing device.

Estimating Transfer

The children were asked to read some test sentences made up of phonics vocabulary from the first three Correspondence lessons (Easy Passage), and another set of sentences using vocabulary from Lessons 3-6 (Hard Passage). Three forms of the test sentences were prepared and children read a different form in November, January, and March. The results shown in Table 10 are given in terms of

Table 10

Errors (in %) on Phonics Vocabulary in Connected Prose

	Easy Passage			Hard Passage		
	Nov.	Jan.	Mar.	Nov.	Jan.	Mar.
Suburban						
Rdg. Grp. I	0	02	0	32	22	16
II	07	04	04	48	21	22
III	25	0	0	77	31	21
IV	25	12	0	--	65	41
Rural						
Grp. I	62	19	12	--	78	31
II	58	44	19	--	--	37
III	100	40	15	--	--	71
IV	--	62	50	--	--	--
V	--	--	69	--	--	--

reading groups rather than correspondence groups. As can be seen in Table 10, some groups of children did not attempt the passages in November and January (some had not reached that point in the lessons), and all children who did attempt the "Hard" Passage were still making a great many errors in March. The "Easy" Passage, on the other hand, shows a regular decrease in error over time. These findings, and others during the year, lead us to think that transfer of phonic skill to new texts comes very slowly, and is only one of the strategies children are using when they attempt new material. This test, of course, actually attempts to curtail the use of other strategies, thus making the decoding task even more difficult.

Further Teaching

After much review and recycling, the children learned to handle the vowel contrasts of short and long a and i. Each new consonant introduced served to strengthen the vowel contrasts, but consonant correspondences were always much easier to learn than vowel correspondences.

Suburban Class. After the drop in performance on Lesson 6, correct responses steadily increased over the next few lessons until Lesson 10 in which the first digraph sh was introduced. The children seemed to need to hear it contrasted with other sounds. Three lessons in auditory discrimination were written contrasting sh-ch, sh-s, and sh-wh. These lessons seemed to solve the problem for the suburban youngsters.

By Lesson 11 (January), the procedures outlined in the lesson, plans were natural and easy for the suburban children to follow. They no longer needed repetition of the instructions, but were able to supply the steps of the analysis on their own. The teacher pointed to words and asked (Step 1), "Are they the same at the beginning?" Pupils supplied the rest independently. "They are the same at the beginning, but not at the end. Mat and map both begin with m, but mat ends in t and map in p. Both have a short a in the middle." We did not want the children to learn a sterile formula, but their ability to report in this fashion shows that they were observing salient contrasts without prompting. Each step continued to be elaborated in the manual but the suburban teacher eliminated some steps for Group I and II (all but four children) from this point on.

Another indication of independence occurred during the letter substitution games. Without elaborate instruction or discussion, groups could go around in a "reading circle" and, with the teacher saying each word, change Nan, to tan to tin to tip, etc., without error. Sometimes this was also done by writing on the chalkboard.

Rural Class. In the rural class, letter substitution was also a successful exercise, but the skill did not become automatic. Discussion of what letter needed to be changed, in what position in the word, and what new letter was required, preceded this type of exercise for most of the year.

Lessons in the Michigan Listening and Matching programs now included two and three letter words. Errors had dropped, and the matching exercises were discontinued after Christmas.

The whole class and small groups worked to discriminate pairs of letters and sounds using the PL Lesson 8's. The first of these, b-d, was a particularly hard discrimination. Discriminating sh from ch was impossible. In Group I, responses dropped from 95% correct in the previous lesson to 64% for the sh lesson. We decided that sh should be taught separately, and then contrasted with s or some other letter, before comparing it to ch. Both digraphs needed to be taught in isolation for these children before being compared. This had not been necessary for the suburban children.

Children with speech problems had added difficulties discriminating sounds. For example, one boy could not hear or correctly produce a pair such as fin and thin since he pronounced both with the initial sound /f/. He probably heard the two words as homonyms.

Although we had to monitor the lessons carefully in the rural class and make additions that hadn't been necessary in the suburban class, this was all to the good. The rural children did not make intuitive leaps. They let us know by their performance where the gaps in the program were. But even so, they were learning. Performance on auditory-visual discrimination lessons was improving by the first of the year. They began to know what to look for and what to listen for, and we began to fill in the steps that would help give them success.

Now exercises of the "Charley Chipmunk changed chairs." variety were like a game for the children. They especially liked and did well with a fill-in type of lesson. For example, "Listen to this word and tell me what letter(s) it begins with --chip?, --dip?" Although the children could remember that /c/ = ch, they forgot what letters they were supposed to add to it. So the teacher wrote __ip on the board before beginning the exercise, and the children wrote in the initial letters to produce the desired word. Then they were usually able to read the word they had written. Sometimes they wrote on their own individual magic slates instead.

Initial consonants were easier to discriminate than final consonants for all children, but final consonants were especially difficult for the rural children to discriminate. In some cases, short term memory was at fault. In an exercise such as the following, "Which word ends with a different sound--man, bun, mat?" the children could not keep all three words in mind at once. Visual practice preceding this type of exercise helped.

Teaching two-syllable words

Inflectional endings. Lesson 12 dealt with the morphological endings -ing, -er, and -ed. Group I in the suburban school whizzed through this lesson with a score of 100% correct oral responses. Their responses seemed almost intuitive. Little explanation was needed. For example, not only could they read words in which the original final consonant had been doubled, they could also write such words. The other two groups in the suburban school did almost as well as Group I.

The addition of inflectional endings to known words added considerably to their difficulty for the rural school children and they performed very poorly. Children in this room often omitted these endings in their own speech (See Chapter V). Perhaps this made the task harder. But for whatever reason, they did not sense the appropriate changes in the words, and as usual, when a task required them to make connections that had not been explicitly taught (our fault!), they became confused. Group I in the rural school dropped from 95% correct oral responses in the previous lesson to 60% correct for this one; Group II dropped from 84% to 60% correct. The rural youngsters could learn to identify the words in their different forms, however, and so the aim of the lesson was shifted to reading the words without analyzing them. (Later in the year, some rural children were able to be more analytic about word endings. Lesson 21, -ss with short a, i, o, was very productive for them. At this point, they had figured out when to double a final consonant and how to recognize a known word even when a suffix had changed its visual shape.)

Disyllables. Lesson 13 treated two syllable words. The idea was to demonstrate that familiar letters and sound patterns occur in longer words.

The top two groups in the Suburban class, 20 out of 24 children, could do this type of lesson easily, and requested more of the same type of activity. Not only did they find the familiar CVC words quickly but attempted to say the entire word--successfully in most cases. Group II was as competent as Group I. The success of the lesson suggests that the suburban children were now transferring phonic skills to reading new material. (This was in late January.) The suburban teacher had anticipated difficulty with this lesson, and was delighted at the good results.

According to the subjective evaluation of the rural teacher, this type of exercise was productive for her class, too. Groups I and II could read a good portion of the words and, in general, liked the lesson. However, her judgment is not reflected in Group I's oral performance. Their responses were correct only 60% of the time on this lesson. No data was taken for Group II on the lesson.

Introducing Short o

Vowels are clearly harder to learn than consonants, and more time was spent on them, both initially and in re-cycling, than had been anticipated. Short o, the third vowel to be presented (Lesson 14, 15) was no exception.

Suburban. In the suburban school, watching children during these lessons gave one the distinct impression of confusion and hesitation that was not usually present. With a lot of practice in auditory and visual discrimination and vowel substitution, Groups I and II were able to give correct responses when presented with short o words. Strangely enough, although this was an extremely difficult lesson, total time spent teaching it did not exceed other lessons. Group I spent two days on both lessons; Group II, three days; and Group III, five days. (But we didn't time the actual lesson period or the latencies between question and answer.) The problems apparent to the observer and teacher were not reflected in the pupil's oral responses, either; for example, Group 1's oral responses were 90% correct on Lesson 14, and 95% correct on Lesson 15. The children were already able to handle one set of vowel contrasts, and so were probably not learning a new concept, only a new sound-letter value. If this was so, then the task was really easier. That was what we had hoped would happen. Maybe we had also learned something about how to present the lessons as well.

Rural. The short o was easier to learn for Group I at the rural school than Group I at the suburban. Here again, the rural teacher isolated the o sound. The time spent on this new correspondence was only two days for both Groups I and II. Normally, Group II in the rural school spent an average of three days on a lesson.

Irregular Words

In Lesson 16, the first irregular word, some, was presented, but not formally analyzed. Throughout the entire sequence, suburban pupils in Group I and II had no trouble reading or spelling the irregular words. Conversely, whenever irregular words appeared in the program such as done, none, some, etc., the rural teacher omitted them. She felt the pupils were learning to read these words correctly in context, and a close phonic analysis might be confusing and interfere with reading.

Subroutines

Besides writing extra review lessons, auditory and visual discrimination lessons, and adding a recycling section to each main lesson, special subroutines were written to supplement the *PL* program where needed.

High Risk Program. One group in the rural class had been given a special "high risk" reading program in November (see Chapter III). Although the high risk group did not participate in the *PL* program, by February they were able to listen and fill in either the initial letter or final letter of *glad*, *mad*, *sad*. They had learned earlier to change *mad* to *sad* to *glad*, and to change *run* to *sun*, and *jump* to *dump*. Their new words, *here* and *high* were compared as well.

Word Families. A "word families" subroutine had been written to coordinate the correspondence program with the reading program. Previously practiced one-syllable words from the Chandler vocabulary were chosen e.g., *swing*, and lessons written to help students recognize the unchanging part of the syllable in different words, e.g., *-ing*. The strategy of each lesson was to identify the known word, and to answer a riddle with a word that rhymed with the known word. The riddle answers were listed on the chalkboard as they were given and a number of activities dealing with these words followed. Children were asked to identify the words in random order, to identify the initial letters of the rhymes, to identify a word in the list when given its meaning, to pronounce all the words in random order, and finally, to make up new words on the model. The nine word family lessons included the following phonograms: *ing*, *am*, *an*, *ill*, *op*, *it*, *et*, *in*, and *ig*. Each lesson took about two days, and there were two simple written assignments, asking for completions such as:

ran.
Sam is a
man.

The first lesson of the Word Families subroutine was tried out with Groups I and II in the Suburban class. The observer reported that "they liked the riddles." Thereafter, these lessons were only used with the lowest group in this class.

In the rural class, Group I had been given the "word family" lesson when they were on Lesson 5 in the *PL* program, and Groups II and III began to work with "Word Families" when they had completed the first 3 lessons (about Christmastime). In January and February, the rural reacher composed some jingles which she gave to the entire class to finish. (e.g., I can see a pig. He is very _ig.) Children then thought of other _ig words. Later, these exercises included such choices as "I will ___ (rig, dig)." This full group practice preceded the word families subroutine which was then presented in small group lessons. After awhile, the first part of the subroutine lesson was itself presented to the full group.

Blending. In the rural school, the four children in Group III were not retaining what they had learned from day to day, and a separate subroutine was written for them. The lessons were based on the assumption that a certain minimal number of words must be recognized on sight by these children before any analysis of their components became fruitful. This is an old-fashioned and non-imaginative hypothesis. The subroutine, however, built in some other skills. The short vowel words (using a and i) in the first five lessons were used to help these students hear separate sounds and recognize the letter standing for each sound. The procedure was as follows: The teacher pronounced a word with a slight hesitation after the first sound (e.g., Ss--am), and later the last sound (e.g., Sa--m), and asked a child to say it fast. Another part of the subroutine, which we hoped would increase visual memory span, asked the child to look at a particular word, say it, then close his eyes and try to "see" all the letters and say them aloud--these were CVC words. (For some reason, the children really enjoyed this exercise.) Finally, the children reviewed all the words by reading them in sentences. This subroutine, we called it Blending, began for Group III on February 20.

Progress Through February

Lessons Covered

Figure VIII shows the progress in the PL Correspondence Program in both classes through February. The data given in the Figure refers to the time when a group finished a particular lesson.

Suburban. In the Suburban class, Group I had finished PL Lesson 16; Group II, Lesson 15, and Group III, Lesson 10. (Group III had also been using the Word Families Subroutine and the Sullivan Programmed Reading.) Translated into content covered, this means that all groups in the suburban school had done four or five of the Lesson 8 discrimination exercises, and had dealt with plurals and "s" in verb agreement; in addition Group II had been introduced to the third vowel in the program, short o; and Group I was comparing short and long o with the previous vowels. All groups were enlarging their repertoire of words by adding more consonants.

Rural. In the rural class, during whole class lessons in January and February, the sound-letter correspondences of r, d, s, b, f, h, l, t were practiced. These were reviewed during small group meetings. Children pasted pictures beginning with d in a large construction paper door. They found pictures of r and p and l objects at other times, and were asked to draw a picture of something that began with r, t, h, and f. Visual discrimination work, particularly with the ascending and descending letters, was also done during full group time.

The small groups worked with the Word Families subroutine and the PL Program: Group I was on the PL Lesson 8's doing discrimination exercises for pairs of letters we had thought might give trouble; Group II had completed Lesson 7 on plurals and was beginning to work on Lesson 8's, and Group III had been introduced to Lesson 6 which introduces long a in comparison to short a words. Group III had just begun the Blending subroutine at this time and were to continue to work with it for the next eight lessons.

Figure VIII

Monthly Progress in the Correspondence Program Through February

		Suburban			Rural		
Lesson	Content	Grp I	Grp II	Grp III	Grp I	Grp II	Grp III
1.	d,s,a	Sept.	Sept.	Sept.	Nov.	Nov.	Nov.
2.	m					Dec.	Dec.
3.	d,m,a	Oct.					
4.	t		Oct.	Oct.	Dec.	Jan.	Jan.
5.	i		Nov.	Nov.			
6.	$\bar{a}$,i				Jan.		Feb.
7.	plurals	Nov.	Dec.	Dec.	Feb.	Feb.	
8.	b-d,b-p etc.						
9.	n	Dec.		Jan.			
10.	sh			Feb.			
11.	p	Jan.					
12.	-ed,-er, -ing						
13.	disyl-lables		Feb.				
14.	o	Feb.					
15.	o						
16.	$\bar{o}$						

Correspondence Tests

In February, the PL classes and several other first grades were given a correspondence test. Both the PL suburban and PL rural class were required to do the same test which covered letter-sound correspondences up to Lesson 11 (p in initial position). Included in the test were consonants d, s, m, n, t, sh, and p, and the medial "short" and "long" vowels a and i. (See Appendix D-1 for test items.)

There were six tests in all. In five of them, the teacher dictated a word, part of which appeared on the child's paper. The child's task was to fill in the missing letter(s). Test I, II, and III, tested initial consonant, final consonant, and medial short vowel (a or i), respectively. In Test IV, several short vowel and long vowel words were dictated but the initial consonant of each appeared on the child's paper. Test V was a spelling test, and in Test VI the child was asked to listen to pairs of words that were different in only one position, and mark on his paper where (in what position) he heard a difference. Each test was given to the whole class on a different day.

In the suburban class Groups I and II had been systematically taught all the material covered by the test, but Group II had not yet been taught sh and p.

In the PL rural class, the following had not been taught: sh and p, to Group I; n, sh, and p to Group II; and n, sh, p, long a and i to Group III.

Results: PL-Suburban Class.

For a complete description of the results for all classes tested see Appendix D-2 . In the suburban class, there were no errors on Test I; on Test II one child made two errors, and there was one error each for three other children. The final consonants giving trouble in Test II were the last ones taught: sh and p. Test III asked for a medial a or i. In this test, one child made two errors, and two children each made one error. In the first three tests, then, five children made one or two errors, and 19 children made no errors at all.

In Test IV the initial consonant was supplied and the child completed a word having a long or short vowel. Two children in the lowest group, whose instructional program had not yet included long vowel words, made six errors each; eight other children made errors; either 3, 2, or 1 (4 of the 8 made one error). Most of their errors, (14 in all), involved the word shame (4 errors) or shine (6 errors).

Test V asked for a discrimination: the childred had to decide where they heard the difference in minimal pairs. Seventeen children made no errors, 6 children made one error, and one child made 2 errors. When the difference was in initial position one error was made; in final, 3 errors; in medial, 4 errors.

In Test VI, the spelling test, 16 children spelled all words correctly. In the 21 errors of the remaining eight children, the only consonant errors were a confusion of t/d in spelling mate; the other errors were the result of decisions about vowels, or whether to add a final e.

To summarize, eight suburban children made no errors in any of the tests, and eight others made one or two errors over all the tests. We judged that the children were learning from the program.

Results: PL-Rural Class.

The PL rural class gave more responses when only a single consonant or vowel had to be inserted. About half the class made two or fewer errors on each of the first three tests. They did almost as well when asked to discriminate auditorially between a pair of words--seven students made two or fewer errors. By far the hardest tasks were the spelling of a whole word, or all of it but the initial consonant. In Test IV only three children, and in the spelling test, only two children, made two or fewer errors.

In general, scores on the correspondence tests in the rural school carried the same rank order as membership in reading groups, that is, the three best readers averaged 80% or better on all the tests while members of the second group averaged between 70% - 95% on the first three tests but between 40% - 60% in the last three.

There were four children not assigned to a phonic group. Since the correspondence tests were administered to the whole class, we had results for their performance too. These results averaged 50% in the first three tests for one child, but much lower on the average for the others. There were five zero scores and eight scores below 25% for this group. Several of these children were absent for one or more of the tests; they were more frequently absent, on the average, than the other children in the class.

Some of the material had not yet been systematically taught at the rural school when the tests were given. Results of Test I and II (initial and final consonant to be inserted) showed that most of the errors occurred for n, p, sh; letter-sound discrimination which had not yet been introduced.

Test III (short a and i to be inserted) showed that Group I and II had a good grasp of this discrimination but several members of Group III did not. The response of Group III showed omissions and insertions of consonants. All other errors were a substitution of *a* for *i*. The *a* as a response in medial position had been overlearned, so review exercises were prepared to help take care of this.

Test IV (complete all but beginning letter) and Test VI (spell the whole word) showed that no one could produce *sh* for /s/ but that Group I and II could deal with the short vowel words which had been presented in the program. Almost all the children could spell *mad*, *sad* and *Sam*--words introduced in the Program, but only Group I could spell the other short vowel words, *dim*, *Nan*, and *dam*, with no visual cues. When the first letter was given, Group I could also spell some long vowel words: *tame*, *made*, but the other children had very few correct responses on long vowel words.

Test V, discrimination of minimal pairs, showed that more children heard differences in initial position, and least in final position (12 errors *vs.* 22). There were 18 errors when the difference occurred in medial position.

Results in non-PL Classes

To see how another group of children would perform who hadn't had phonics instruction other than attention to initial consonants, the tests were administered to the other two non-PL first grades in the suburban school. In each test the two suburban classrooms exceeded the PL Suburban class, both in frequency of error and number of students making errors. The differences increased when long vowel words were attempted. Differences between the non-PL suburban classes and the rural PL class are most marked in Test III (short *a* and *i* inserted) in which rural children made a total of 30 errors as compared to 91 errors by one non-PL suburban class and 98 by the other. The rural children also made fewer errors in Tests IV and VI, the long vowel words than the two non-PL classes.

In the easiest tests, Tests I and II, the rural children did not do as well as the non-PL suburban children. Here, the non-PL classes had also had some instruction. The old adage that "you learn what you're taught" proves true for these classes. The test results, nevertheless, show a good deal of learning without teaching going on in the non-PL classrooms (if one assumes instruction only in initial consonants).

After administering the tests and looking at the results, the two non-PL first grade teachers in the suburban school requested, and were given, copies of the PL Correspondence Program to use with their children during the remaining months of the school year.

Final Lessons

Introduction of the Vowels: u and e

In the suburban class, when wh was introduced with short a, i and o (Lesson 20), correct response was high and without hesitation so it seemed that the three vowels so far presented had been assimilated. However, regression did occur when short u was added (Lesson 22). Much time had to be spent hearing and comparing short u to a, i, and o. The pupils had difficulty producing the letter u in their written work, that is, they substituted o for u in such words as bud and mud. Short a and i, however, were rarely substituted for u.

For some reason, ng and long u (Lesson 24) was easy for the suburban youngsters. Short u was also reviewed in this lesson, and transfer from the Chandler book Swings and the Sullivan material was evident. Pseudo-words were proposed by the children and read with as much ease as real words, e.g., dung and mung were read quickly when put on the chalkboard. Tung was suggested as another possibility. Perhaps, short u should have been introduced in -ung words from the beginning.

Only Group I in the rural school had progressed beyond reading a, i, and o words. For Group I, short u was the hardest vowel of all to learn. It was hard to reproduce; heard to hear; and hard to read. The confusion in the suburban class had been confined to comparing o and u. Rural pupils found the addition of u generally confusing.

Short e (Lesson 29) posed no problems in either suburban or rural schools. This was a very easy lesson for the entire group compared to short o and u.

Long e (Lesson 30) was also equally easy for both PL classes. A pupil mentioned ea in the suburban class, and the teacher provided a rationale for pronunciation.

Blends and Digraphs

Only Group I in the rural school had reached the point in the PL program where digraphs and blends are taken up. Learning that -tch is just a positional variant of ch was hard for the Group I rural children to learn. They learned to read a word correctly, however, when the word ended in -tch, although they never did remember to put in the -t- when writing such words. We were pleased enough at the first accomplishment, and so emphasis was shifted to reading these words without requiring any analysis.

Another problem for the rural children was hearing the -ng /ŋ/

at the end of a word. Not often could they identify the letters when listening to a word ending in ng. (The ng combination was to be a most difficult correspondence for all children tested, PL and non-PL, at the end of the year.) As with the -tch combination, the children could read the words, however, and this, after all, was what we really wanted.

By Lesson 23, the language and procedures for word building were so well established in the rural class that the teacher was able to take short cuts. Pupils volunteered information independently. One child said, "If you changed the t in blot to ck, you'd have block."

Lessons on the blends sl, pl, bl, fl (Lessons 25, 26, 27) were easy for both suburban and Group I rural children. In the rural class, we had at last learned the right procedure. Reading of the words, rather than close analysis, was the main focus. Besides learning to read the words, the rural children could also write them with no difficulty. In the suburban class as well, very few examples were necessary before children in Group I and II could read new words containing these combinations of letters. With Group III in the suburban class, however, recycling was needed after each step, e.g., when teaching fl, the teacher needed to go over pl and bl examples again at each step. These children could not make the transfer from one blend to another. They had trouble remembering. In the "Notes to Teacher" section of the teacher's manual, we should have advised the teacher to constantly recycle with pupils who needed additional practice before proceeding to new material.

Final consonant clusters were mastered quickly (Lessons 31, 32). This was the last lesson for Group I at the rural school.

The Last Lessons

In the suburban school, the last ten lessons took very little time. The ck in final position needed practice, but wasn't a problem. Training for correct response to -ke (Lesson 34) was not necessary at all. Children knew this correspondence already from their reading. The lesson was used to expand the repertoire of words. Group I in the suburban school did not need the lesson introducing b, h, and th either. It was used as review, and again, to demonstrate to the children how much they had enlarged the repertoire of words they could attack independently.

The last two lessons, introducing -x, v-, and -ve; y-, qu-, j-, -zz, and -ze, provided good review in consonant substitution.

Estimating Transfer

Children read passages in April and June which utilized phonics vocabulary, and again alternate forms were prepared. Passage I contained words taken from the PL Lessons 1-5; and Passage II contained words from Lessons 6-10. The increased vocabulary allowed greater use of words which had not actually been practiced in the lessons. Table 11 presents the percentage of error of children (divided into their reading groups) for these passages.

Table 11

Errors (in %) on Phonics Vocabulary in Connected Prose

	Passage I		Passage II	
	April	June	April	June
Suburban				
Rdg. Grp. I	02	--	01	05
II	06	--	03	10
III	10	17	14	56
IV	21	12	26	19
Rural				
Rdg. Grp. I	06	--	17	10
II	10	17	32	30
III	18	17	65	33
IV	65	46	81	--
V	81	44	--	--

In the Rural school, Reading Group V had not participated in the PL program, and Group IV had spent half their time in subroutines. Group IV children had been able to learn to read the phonically regular words they had been taught, but as the percentage of error in the Table shows, had not been able to transfer very successfully to new words in new context. Other groups in the Rural school read 80% or more of Passage I without error, but only Group I could decode Passage II words with minimum error. Words in Passage II constituted new material just being studied for rural Groups II and III, and perhaps we were asking too much to expect them to transfer to new materials so soon. It may be that in any phonics program there will be a lag between initial learning and ability to apply that learning. At any rate, for Group II and III in the Rural school only 70% of the words in Passage II were decoded without error.

In the Suburban class, the first two Groups read Passage I with a low rate of error in April and its alternate form was omitted for them in June. Errors for Group I, II, and III in the suburban class increased from April to June on Passage II. The rate of error remained fairly low for the first two groups, but Group III, with 56% error was not a reliable indicator of ability. Nevertheless, there is no indication that from April to June there was increased ability among the top three groups to decode new words based on old patterns. Besides the usual June slump, a lag in ability to use a new skill independently is probably what these figures are showing.

Progress by June

Figure IX shows the month-by-month progress of both classrooms in the PL Correspondence Program during the year. The discrimination of certain sound/letter pairs (Lesson 8's) were used more than once by the teachers, but in the Figure these comparisons are listed where they first occurred. The Figure does not show the various subroutines or re-cyclings which took place in the groups. For example, Group III in the rural school spent all of March on the Blending Subroutine which isn't shown at all in the Figure. In the suburban class, Group III seemingly spent two months, November and December, on Lesson 6--long i. What really happened was that this group spent those months reviewing all material up to that point including comparisons of long and short i, long and short a and i, and so on. Since data on errors accompanied all lessons through Spring, the Figure shows the cumulative load each group could deal with, with a minimum of error, at any given month.

Figure IX is also limited in that it only shows content of small group lessons, but in the rural school whole class lessons occurred throughout the year, and it was here that the PL discrimination lessons were usually first introduced. For example, at the end of March and through April, when the correspondence groups in the rural school were studying sh but before they had encountered ch, th, or wh the following contrasts were studied in full group lessons:

3/20	s - sh	4/5	sh - wh	4/12	ch	4/20	s - f
3/21	s - sh	4/6	sh - wh	4/13	ch - wh - sh		
3/23	s - sh	4/7	sh - wh	4/18	ch - wh		
4/4	s - sh			4/24	ch - sh		

The differences between the two classrooms is apparent. Group I in the rural school moves nearly at the rate of Group III in the suburban school. This parallelism is also apparent in the reading texts covered (See Figures I, III in Chapter III). But there are indications that Group I in the rural school was beginning to move faster, especially after February when only the top three students in the class belonged to the group. At the end of April, rural Group I and suburban Group III had both completed Lesson 13. In May, however, rural Group I was able to learn two more vowels in two values each and deal with the digraphs th, sh, ch, -ng, while suburban Group III began to slow up a little. In July the differences in the two groups increases even more. This suggests that the top group in the rural school had begun to "catch on" and would increase their lead in the future.

Figure IX

Monthly Progress Through the Correspondence Program

Lesson	Content	Suburban Grp. I	Suburban Grp. II	Suburban Grp. III	Rural Grp. I	Rural Grp. II	Rural Grp. III
1	d,s,a	Sept	Sept	Sept	Nov.	Nov.	Nov.
2	m						
3	d,m,a	Oct.	Oct. Nov.	Oct. Nov.		Dec.	Dec.
4.	t				Dec.	Jan.	
5	i						Jan.
6	ā,ī				Jan.		Feb.
7	plurals	Nov.	Dec.	Dec.	Feb.	Feb.	Mar. Apr.
8	b-d,b-p.etc			Jan.			
9	n	Dec.	Jan.		Mar.	Mar.	
10	sh			Feb.	Apr.	Apr.	May
11	p	Jan.		Mar.			
12	-ed,-er,-ing			Apr.		May	
13	disyllables		Feb.		May		
14	o	Feb.					
15	o			May			
16	o		Mar.			June	
17	s-sh ch	Mar.	Apr.				
18	-ch						
19	ch-tch tch	Apr.					
20	ch-wh wh						
21	th-f -ss						
22	h-f a,f			June			
23	b,n,th						
24	l-w ū,ng						
25	sl	May	May		June		
26	pl,bl,fl						
27	pl,bl,fl						
28	pr,br,fr,dr						
29	e						
30	ee		June				
31	e,nt,nd,st,ft	June					
32	nt,nd,st,ft						
33	-ck						
34	k-c -ke						
35	k-g,-x,-ve,v						
36	y,z,qu,z						

Figure IX also indicates that for many children, the PL Correspondence Program could well continue into the second year of school. Only one group finished all the lessons and four children in the rural school did not participate at all in a formal sense. We have assumed that these two classes represent the extremes of abilities one would find in a typical first grade. The program in correspondences is flexible enough, then, to benefit most first graders, i.e., they can learn from it, even if all aspects are not completed in one year.

Data Collection

During the year, the observer in each classroom collected samples of oral responses and kept records of written work. Besides this data, weekly conferences with staff and teachers served to clarify impressions of strengths and weaknesses in the PL Correspondence Program. In June, written tests were given to seven first grade classes, including the two PL classes. The results of the tests are discussed in the following section. Oral and written responses during the year are described below.

Oral Responses

During the twice weekly lessons, simple data was taken of all the children's responses. In the Suburban class, we collected very few samples of Group I and II responses after Lesson 19 (about the end of February), since those children were no longer making as much as 05% error, and we thought the observer's time could be better spent on other chores. The number of responses sampled, and the percentage of those responses which were correct, are given in Table 12 for both PL classes. Since children moved from one group to another during the year, the N. in the table represents the aggregate number of children in a group.

Of all the groups, the top two suburban groups had the most correct responses, thus confirming our notions about the suitability of the program for the average and above average children. Group I in the suburban school had an almost errorless performance. Members of the PL staff had been concerned about this at times during the year, and wondered if we were making the program challenging enough for this Group. Both the teacher and observer objected to such reasoning. The interest and enthusiasm in the group were consistently high, they said; their responses were quick and they were "sharp;" and they could learn new concepts with little need for trial and error.

Conversely, the average correct response of Group I in the rural school does not adequately reflect their progress. Although in Table 12 these children have an average response that looks like

Table 12

Oral Performance

	Group	N.*	N. of oral Responses Sampled	% Av. Correct
Suburban Class	I	9	430	95
	II	10	540	89
	III	4	503	78
Rural Class	I	6	533	77
	II	13	643	79
	III	4	395	72

* Aggregate number of children in group.

that of the able groups, the amount of material they were able to absorb, as charted in Figure IX, shows they were able to complete 27 lessons from April to the end of the year. Group II in the same school completed eight lessons during this period, and Group III completed only four.

Several groups, including Group I in the rural school, received average correct response scores of from 77% to 79%. This indicates that they were answering correctly almost 8 times out of 10, and we interpret this to mean that they were learning from the program. Group III in the rural school averaged 72% correct in their oral responses, and this is lower than we had expected or hoped. The program as now written was asking too much of these children, it seems, for most of the year. Their responses did improve toward the end of the year; their average correct response on their last three lessons was 88%, 80%, and 75%.

Written Responses

There were 156 worksheets in all, including the Lesson 8 worksheets and the worksheets to accompany review lessons. Some of these were completed in the group sessions with the teacher; some were done, checked immediately, and kept by the children; some were self-corrected; some were used for review or supplementary work. But no group in either class used all 156 of the worksheets. The figures in Table 13 give an estimate of how many worksheets each group completed, and the average percentage correct for the worksheets we graded.

In mid-May, the observers began testing pupils and did not take samples of worksheet performance. In the column marked number graded, only those worksheets actually graded by the observer are included. Note that Group III in the suburban school is estimated to have completed 92 worksheets of which only 39 were graded. A large number of the worksheets were done jointly by these four children with the teacher present, or were self-corrected. Such data was not included in the Table; Table 13 gives the actual number of worksheets we collected and for which we recorded grades. (This does not always preclude teacher help on some of the items.)

Table 13

Written Performance

	Group	N.*	Est. N. completed	Worksheets Num. Graded	Av. % Correct
Suburban	I	9	101	69	94
	II	10	92	62	87
	III	4	92	39	89
Rural	I	6	94	84	91
	II	13	57	48	83
	III	4	32	22	84

* Aggregate number of children in group.

Written performance for all groups was similar. Both classes did surprisingly well considering their wide range of reading skills. This lack of difference is, perhaps, a reflection of the purpose of the written work as we conceived it. The worksheets were not supposed to be a testing device but were meant to reinforce and review what had just been taught in the oral lessons. The responses, therefore, reflect this fact and not the individual differences among children or the difference in capability among groups.

When written and oral responses are compared, the average percentage of correct response in the suburban class is comparable for Group I and Group II but not Group III, nor any of the groups in the rural school. The rural groups' average of correct oral responses (77%, 79%, 72% for each group, respectively) are decidedly lower than their written average (91%, 83%, 84%, respectively).

One reason for discrepancies between oral and written responses is the competent teacher's strategy when she realizes the children are not comprehending. When our PL teachers found themselves in this teaching situation, they sometimes postponed the worksheets until they could give more review and try new approaches to the teaching. When worksheets following such lessons were used, they were more carefully explained and time was taken to go over each item in advance.

It is a subjective judgment that the rural teacher gave more individual help on worksheets than the suburban teacher. Frequently, in introducing the worksheet to the group, the rural teacher went over many of the items orally with the group before asking them to complete the exercise independently. This is good teaching (considering the ability level of the groups), but given this knowledge, we cannot make the same judgments about achievement based on worksheet performance in this class as we can in the suburban class, where most written work was completed independently.

Low Response Rates

We looked at the data on oral and written responses in specific lessons to find out which of these lessons fell below the average for each group. Exact percentages appear in Appendix D- .

Oral Responses. In the suburban class, Lessons 4 and 6 show a drop in performance for all groups. These were the first vowel comparison lessons. In the two lessons that followed children returned to a high level of correct response. Group III in this class needed to spend more time learning the procedures and language of instruction than the other groups. This is reflected in their low level of correct response to the first few lessons. After Lesson 6, they seemed to be responding correctly most of the time.

In the rural class, Group I had trouble in Lessons 5 through 8 (the long and short a, i comparisons), and again in Lessons 12 and 13 (the suffixes). Group II's oral response rate is variable throughout the year but their lowest performance parallels that of Group I in the same class. Group III in this class, after a slow start, seem to be stabilizing at an acceptable level of correct response toward the end of the year (Lessons 8 through 10).

Written Responses. When written performance levels dropped, the worksheet itself was usually found to be the culprit. During the year, several of the worksheets were revised after use with the suburban children before being presented to the rural class.

Revisions occurred when either the teachers or observers found a worksheet unacceptable because it was either too easy, too hard, the format was confusing, overcrowded, lines were needed, the type too small or the pictures ambiguous.

For example, worksheets for Lessons 12, 18, and 25 were difficult for most of the students. The worksheet accompanying Lesson 12 was completely revised since in its original form the task was ambiguous. The worksheet to accompany Lesson 18 and one of those accompanying Lesson 25 were crossword puzzles. When first introduced, crossword puzzles were extremely difficult for all.

Pupils at the suburban school learned how to use them but this never happened at the rural school. In any future use of the program, the teacher should guide the children in the completion of crossword puzzles for as long as necessary.

Occasionally, words were used because they fit into the pattern being taught and expanded the inventory of possible examples. These words were not always appropriate. For example, pose, dome, and chap were not in the children's vocabulary. Usually, a casual explanation of their meaning and a rationale for their inclusion was all that was needed for the suburban children, but for the rural youngsters the inclusion of meaningless words interfered with the task.

Poor performance on the worksheets accompanying Lessons 4 to 6 in the rural school was not the fault of the worksheet but reflected difficulty with the vowel comparisons. Extra exercises were devised to provide additional practice at this point, and again were necessary when the first consonant digraphs were introduced.

Sometimes a worksheet proved to be too easy. One such example was the "match a word to sample" variety. These (there were nine of them) were not used with the suburban class at all.

Discussion

Prior to the teaching of the correspondences, a decision was made favoring early presentation of many concepts, even though standards of mastery might be low initially. Since the same concepts would constantly recur and be reviewed throughout the sequence it was hoped that, as their inventory of examples expanded with the addition of each new letter, the children would come to understand such ideas as order, patterning of vowels, and so forth.

In practice, we were not always strong minded enough to follow this plan rigidly. There were times when we wrote extra lessons, and reviewed until at least a certain level of mastery was attained before allowing children to go on. There were many occasions, however, particularly when consonants were being introduced, when the original plan was followed even though our data showed that children were not automatically recognizing and responding correctly to a particular sound-letter correspondence with any degree of regularity. The percentages shown in Appendix D-3 present partial justification for this strategy. Percentages correct do rise as examples are added. Findings from the correspondence tests given in June, add further corroboration.

Examining the original hypothesis from the standpoint of actual performance, one might very well be inclined to say that for learning of consonants, consonant clusters or digraphs, initial low performance is acceptable and in all probability will change. When vowel correspondences are encountered, we would revise our original notions and insist on a higher level of performance from the beginning.

Part III - Evaluation

June Tests: Comparison of Classes

Six group tests were given in June. The classroom teacher administered the tests in all cases but one; a P.L. staff member administered the tests in the Urban class at the teacher's request. Because of absences in some schools, the same number of children did not take all tests. The classes tested have been coded as follows:

PL Suburban
PL Rural
H Suburban
S Suburban
Av Rural
Urban

The Task

Instructions and test forms can be found in Appendix D-4. In each test, the task of the student was to listen to a word pronounced by the teacher and fill-in on his paper the letter or letters missing. For example, the teacher might say "man" and the child would see _an. In each test, sample items were presented first and feed-back given. The child was directed to listen to a particular part of a word in all but the last test. In the last test, the child spelled a whole word which was a CVC nonsense word.

The material in each test was taken from the PL correspondence lessons throughout the entire year. The letters to be filled in and the number of students responding on each test are given in Figure X. (See Appendix D-4 for the test.)

Figure X

Auditory Stimulus in the Correspondence Tests

Test 1 Ini. Pos. (140 *Ss*)	Test II Med, Pos. (final e given) (141 *Ss*)	Test III Ini. Pos. (146 *Ss*)	Test IV Final Pos. (144 *Ss*)	Test V Whole Word (149 *Ss*)
j	i (long)	sl	sh	san
w	i	dr	(t)ch	tas
c	a	tr	th	vap
y	a	pr	ng	reb
k	o	fr	v(e)	zel
qu	o	fl	x	bim
sh	u	br	nt	pid
wh	u	bl	st	hig
ch	ee	final pos.	ft	gop
		-ing -es	nd	nog
		-ed	ck	lut
				dup mag
				fid

The order of test items. The test items were always presented in the same order. It is possible that previous test items affected following ones. It is also possible that children became tired or confused at the end of the tests.

Results

Table 14 shows the mean number correct for each class tested for each of the categories with the total possible correct responses listed under each category. The expected ability level of each class (based on teacher expectations and reading readiness tests) is also listed at the left of the Table. The grand means and percentage correct give some idea of the ability of these first graders to produce the conventional letter for specific sounds in specific positions in word context. The categories are listed from left to right in what seems to be the easiest to the most difficult.

Table 14 (Phonics)

Mean Number Correct by Category and Classroom

Classroom	Abil.	Ini. Con.	Final Cons.	Initial Plurals & Digr.	Long Vow.	Short Vow.	Final Blends & Digr.	Suffixes
Number possible		(24)	(20)	(8)	(10)	(14)	(5)	(3)
PL-Sub.	Good	21.6	18.7	6.9	9.3	12.3	3.7	1.9
VG-Rural	V.G.	21.4	17.4	7.4	7.3	9.0	4.2	2.5
H -Sub.	Good	20.0	15.6	6.7	8.0	7.0	2.4	1.7
S -Sub.	Good	20.2	16.9	6.8	7.2	8.1	3.9	1.5
Av-Rural	Avg.	19.9	15.8	6.7	5.5	5.9	2.4	1.4
-Urban	Low	11.6	5.6	1.2	5.0	4.0	0.3	0.3
PL-Rural	Low	16.4	12.6	4.6	5.4	5.8	1.5	0.8
	Grand $\bar{X}$	18.7	14.6	5.8	6.8	7.5	2.6	1.5
	%	78%	73%	72%	68%	54%	52%	50%

First grade students can produce on demand correct initial consonants more frequently than any other letter category. All first graders have some training in listening for and matching given beginning sounds to letters. Basal reading teacher's manuals provide for this kind of training. Some training is given in listening for final consonants in the Basal manual too but, chances are, most of this learning comes through transfer of training. Where a great deal of attention is paid to final position, as in the PL classes, the result is an increment of correct response over the responses of children of similar ability.

Most of the students can more frequently match a correct letter-to-sound when the vowel is long than when it is short. (This is not to say that they could more frequently pronounce a long vowel word correctly!) Having the name and the sound of the letter the same is a strong cue. This cue is not available when listening to a short vowel word.

Differences in Groups Tested. The suburban "good" classes look remarkably alike in some categories but not others. The PL-Suburban class produced more correct responses, on the average, to Final Consonant, and Short and Long Vowel stimulus words than the other children of similar ability. These were areas in which they had had additional training.

The VG-Rural class made the fewest errors in Initial and Final Blends and Inflectional Endings. This area received emphasis in the VG-Rural class. The VG-teacher stated that she had taught many of the concepts included in our correspondence tests, and that phonics was a heavily stressed area in her classroom.

There is marked dissimilarity in the two "low" classes (Urban and PL-Rural) in almost every category but Inflectional Endings. It would seem that neither of these classes can as yet produce -ing, -es, or -ed correctly on demand, although some PL rural children were exposed to these endings in the PL program. In the Long Vowel categories, both "low" classes performed as well as the "average" class.

The "average" class did as well as the "good" classes in producing the correct initial consonants and initial blends; they did as well as some of the "good" classes in producing final consonants, and final blends. In all but vowels, the "average" class had scores near or above the average of all seven classes. These figures for the average class add a sort of anecdotal validity to the findings.

When responses to all categories are added up, there are a possible 84 correct responses per child. One hundred eighteen children were present for all five of the phonics tests. The total correct responses of these 118 children were recorded and converted to percentages. One quarter of the children tested achieved a rank of from 90%-100%; the next quarter ranged from 89%-76%; the third quarter, from 75%-55%; and the last quarter from 55%-05%.

Table 15 gives the number of children in each classroom who compose each quartile. The percentage of a particular class in each quartile is also given.

Table 15 (Phonics)

Distribution of Classes by % Correct

%	Quartile	PL-Sub. Ss	PL-Sub. %	VG-Rur. Ss	VG-Rur. %	H-Sub. Ss	H-Sub. %	S-Sub. Ss	S-Sub. %	Av-Rur. Ss	Av-Rur. %	Low Urban Ss	Low Urban %	PL Rural Ss	PL Rural %
100-90	1st	13	57	6	43	3	19	5	31	1	07	--	--	1	0
89-76	2nd	9	39	5	36	5	31	5	31	1	07	1	06	3	1
75-55	3rd	--	--	3	21	3	19	4	25	9	64	4	22	7	1
54-05	4th	1	04	-	--	5	31	2	13	3	21	13	72	6	3

Sub-tests: Analysis of Correct Responses

Long Vowels

The "long" vowels were tested in a word frame of the sort Cc_Ce in which C is a consonant and the last letter is silent "e." Two words were dictated for each of the following sound-letter correspondences: a, i, o, u. The long sound of e was tested in two different frames: tr__ (tree) and f_d (feed). Table 16 shows percentage of correct responses by class for each letter-sound correspondence.

Table 16 (Phonics)

Correct Response to Long Vowel Stimulus (in %)

N.	Class	A	O	I	E	U	Average % by Class
24	PL-Suburban	98%	96%	94%	87.5%	81%	91.3
20	VG-Rural	71%	82.5%	77%	65%	70%	73.1
19	H-Suburban	78%	87%	68%	84%	79%	79.2
21	S-Suburban	88%	79%	60%	69%	69%	73.0
20	Av-Rural	77.5%	67.5%	57.5%	36%	35%	54.7
19	Low-Urban	61%	66%	60%	45%	45%	55.4
18	PL-Rural	81%	64%	69%	31%	31%	55.2
141							
	Average % by Letter	79.21	74.28	69.36	59.64	58.57	

1410 = f. of possible correct

Differences in letters tested. Taking all groups, the sound-letter association of long A and O is easier for these six year olds than the other three letters. The associations for E and U seem about equally difficult, with I somewhere in between.

Differences in groups tested. Looking at the average percent correct by class shows the two "low" and the one "average" class about equal at half the responses correct. The "good" classes, except for the PL class, average about three-quarters correct, and the "good" PL class about nine-tenths correct.

Percentage of correct responses for individual letters shows interesting differences when classes are compared. The PL "low" class had been given lessons comparing long A and I words, and some groups within the class had recently been introduced to long O, but neither U nor E had been studied. The percentages of correct responses in the test were in direct proportion to the amount of attention to work in the classroom. The percentage correct for A, I, O, U, and E in the PL-Rural class was 81%, 69%, 64%, 31%, and 31%, respectively. In the other "low" classroom the percentages for the first three vowels were 60%, and for the last two, 45%. This seems to show that the PL-Rural children were capable of handling what was taught even though the correspondence program would probably take them two years to assimilate rather than one. As a matter of fact, the PL-Rural class, with 81% correct for long A, did as well (or better) on this correspondence as the "average" class and several of the "good" classes. The average for long I in the PL-Rural class (69%) is better than any other class but the VG class and the PL-Suburban class.

Division of percentage correct for the other three letters, O, U, E, show the two low and the one average class getting comparable scores (for O - 66%, 64%, 67%; for E - 45%, 31%, 36%; and for U - 45%, 31%, 35%) while the "good" classes range from 20 to 30 percentage points higher. The PL-Suburban class clearly has the most frequently correct response to long vowels, with an average of 91% correct. This shows that a "good" class can absorb and produce even seemingly difficult correspondences (in terms of the responses of other children) in the course of their first year at school.

Short Vowels

Data on the short vowels is taken from the pseudo-words which all had the pattern CVC. There are 14 stimulus words in all; four for short a or /æ/; four for short i /ɪ/; and two each for e /ɛ/, o /ɔ/ or /a/, and u /ə/.

Table 17 shows the percentage of correct responses by class for each letter-sound correspondence.

Table 17

Correct Response to Short Vowel Stimulus (in %)

N	Class	a	i	o	u	e	Average % by Class
				Letter			
23	PL-Suburbann	96	91	91	72	78	85.6
20	VG-Rural	82.5	82.5	40	55	30	58.0
24	H-Suburban	82	50	31	25	31	43.8
20	S-Suburban	87.5	61	40	40	30	51.7
23	Av-Rural	62	51	39	13	17	36.4
19	Low-Urban	39.5	33	16	16	24	25.6
20	PL-Rural	66.2	60	25	07.5	05	32.7
	Average % by Letter	73.57	61.21	40.29	32.64	30.71	

Differences in letters tested. These percentages are not as high as the scores for long vowel responses given in Table 4. This is not to say that long vowel words of the CVC pattern are easier to read than a CVC word. Perhaps the short vowel sounds when heard in word context are more ambiguous and the child may have some confusion over whether he heard, for example, an /æ/ or an /ɛ/ sound. Since pseudo words were used, meaning and recall offered no help. Still, short a, like long a, was most frequently correct, and short u and e least frequently correct. Since e is the most frequent vowel in English, it would seem that frequency of occurrence is not a major criterion at work here.

Differences in groups tested. The two PL classes, who had had most exposure to the sound-letter correspondences in the order given in the table (a, i, o, u, e), reflect the added exposure to the earlier and most practiced vowels. The PL-Suburban class got 90% or better correct for a, i and o, while the PL-Rural class got 60% or better correct for a and i (higher scores than the "average" class). Scores for the last introduced, and therefore less practiced, correspondences drop for the PL classes even though the PL-suburban class still has more correct responses than any other class. The PL-Rural class has fewer correct responses to u and e stimulus words than the low-Urban class. (16% vs. 07% and 24% vs. 05% for Urban and Rural, respectively.) These were the two vowels not yet introduced to any of the children and suggests what their other scores may have been had no phonics teaching been attempted with them at all.

Consonants

The findings from the consonant sub-tests can be divided into scores for initial and final consonants, digraphs (*sh*, *ch*, etc.) and blends (*fl*, *bl*, etc.).

Single consonants. Not all consonants were tested in both positions. The distribution of sounds in English words is such that many letters are rare at the end of one syllable words. Since *r* and *w* were not treated in the PL Program when following a voewl, these were omitted from final position in the test words. The letters *c* and *k* seldom occur alone at the end of one-syllable words; *v* occurs but is a vowel in this position, *j* and *h* do not occur, *f* is usually doubled; and *z* is ambiguous since the morpheme z can be realized as an *s* or *z*; all these were omitted from final position in the testing.

In Table 18 the percentage correct is given for all single consonants tested. Since some sounds were thought to be too difficult to distinguish in pseudo words and also because the list of pseudo words was already long (14 words), five of the initial consonants were tested in real words. The percentages correct for the letters in the real words almost certainly does not mean the same thing as the percentages correct for the pseudo-word responses. But we did find out whether the letters *c* and *k* could be associated separately with the sound /k/ in a familiar word, in this case, *cat* and *kite*, and similarly whether the sound /ǰ/, as in *jug*, would elicit the letter j, when in a pseudo word it could as well have been represented by *g* or *dg* (and this *was* the response given in some cases). Table 18 shows the non-startling fact that it is easier to hear and identify a sound (and in this case produce the corresponding letter) when it occurs in initial position than when it occurs in final position.

There are fewer overall differences in response to final consonants than to initial. No score was more than ±6 percentage points away from the average of 77% correct. Scores for initial consonants show more spread. If the results in Table 18 were to be used to plan letter introduction (but in reality our major intention is to spur others to devise a more rigorous examination of these abilities) then in initial position *s*, *t*, and *r* seem to be the easier letters to hear and associate with the corresponding letters. If letter-sound correspondences are to be taught in more than one position, then either *m* or *n* should be considered as possible first choices. The interesting point here is the seeming ability of children to distinguish and correctly represent sounds occurring close together in articulation and manner of production (for example: *s* and *t*; *m* and *n*). In the absence of empirical data, several logical analyses have placed such letters as far apart in sequence of introduction as possible. This logically reasonable approach may not in fact turn out to be easiest for the child. We realize of course that abilities tested post-hoc do not give us the

Table 18

Correct Responses (in %)* to Initial and Final Consonants

		Position	
	Letter	Initial	Final
Pseudo Word Stimulus	s	94	73
	t	89	83
	r	89	--
	l	85	78
	f	85	--
	m	85	83
	n	84	80
	p	84	72
	g	81	75
	h	81	--
	b	81	71
	z	78	--
	d	75	75
	v	63	81
Real	c	92	--
	y	90	--
	k	88	--
	w	82	--
	j	74	--
Average		83%	77%

* Percentages are based on total number of responses. No. of Ss responding to pseudo words = 149; No. of Ss responding to real words = 14; p and g in final position occurred 3 times and percentage is based on 447 responses in each case.

best kind of data on which to base such judgments, but the speculation is still admissable since one can't test for sound-letter understandings until after some sort of program has already been presented, or some reading experience gained.

Digraphs and Blends. Table 19 gives the correct scores in percentages of responses to digraphs and blends. Several letters and letter combinations are included in this Table under blends, namely qu, -ck, and -x. Although none of these three really fit the other examples given, still they are correspondences which were taught in the PL classes and therefore had to be tested, and they can better be placed in this list than with the single consonants in Table 18.

Table 19 (Phonics)

Correct Responses (in %)* to Digraphs and Blends

	Digraphs		Blends			
	Position		Position			
Letter	Initial	Final	Initial		Final	
	%	%		%		
sh	74	72	sl	77	st	61
ch	73	64	fl	75	ft	60
th(θ)	72	67	br	75	nt	51
wh	48	--	fr	74	nd	51
-ng	--	36	tr	73		
			pr	71		
			bl	70		
			qu	13	ck	42
					x	72

* For initial blends, the percentage correct was based on 146 responses with the exception of qu, based on 140 responses; for final blends, the percentage correct was based on 144 responses; for digraphs, percentage correct was based on 140 responses.

With the exception of x, the blends are, as expected, not known as well as the single letter-sound associations, even with common words used as stimuli. The letter x in final position, however, is as well known as many of the single-sound single-letter responses given in Table 20. Those blends with l and r in second position seem inherently more difficult than other consonant clusters.* The PL Program dealt only with them and this is why the selection of blends tested is limited to them. Children ranged from 70% to 77% correct in responding to these blends.

The letters qu were rarely given as response to the stimulus word quack (a word used in first grade books). It received, in fact, the lowest correct response (13%) so far listed. Blends ending in t or d ranged between 50% and 60% correct, and the ck combination was correct in less than 50% of the responses.

The digraphs fare better. The sh representation of /s/ was best known and equally well responded to in either position. The ch, and th were next, but these were more easily identified in initial position. Quite a few children heard *wh* as *w* (and several of the teachers pronounced it this way) and as a result fewer than 50% actually gave *wh* as a response. The surprisingly low correct response to /ŋ/ indicates that although first graders have lots of exposure to this combination, they might not ever really be aware of its individual graphic components.

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* They are acquired later, cause special articulatory problems for those with speech defects, can be both vocalic and consonantal by logical analysis, etc.

Suffixes. The last category contains three suffixes, *-ed*, *es*, *ing*, and the stimulus words for these were *visited*, *dresses*, and *fishing*. Table 20 gives the percentage of correct responses to these suffixes.

Table 20

Correct Response (in %)* to Suffixes

Suffix	%
-ing	75%
-ed	44%
-es	27%

Note the difference in response to -*ing* in Table 20 (75% correct) and -*ng* in Table 19 (36%). Perhaps the children we tested have not yet separated the sounds and letters and are responding to the larger units in some words. Reasons for low correct response to -*ed* and -*es* will be discussed in the following section on types of errors made.

Summary. Table 21 summarizes the correct production of all letters and letter combinations given in the test. If the limitations of the test are kept in mind, the relative order of the correct responses in Table 21 can be taken as a guide to the relative ease or difficulty of learning of the various sound-letter correspondences.

Analysis of Errors

The reader should note that the relatively greater incidence of one type of error rather than another does not necessarily mean that this type of error defines the source of difficulty. There is no assurance that the "frames" for each type of stimulus were equally difficult or equally representative of the problems that children face in their day-to-day reading and writing of words. Nevertheless, the overall pattern does provide an interesting

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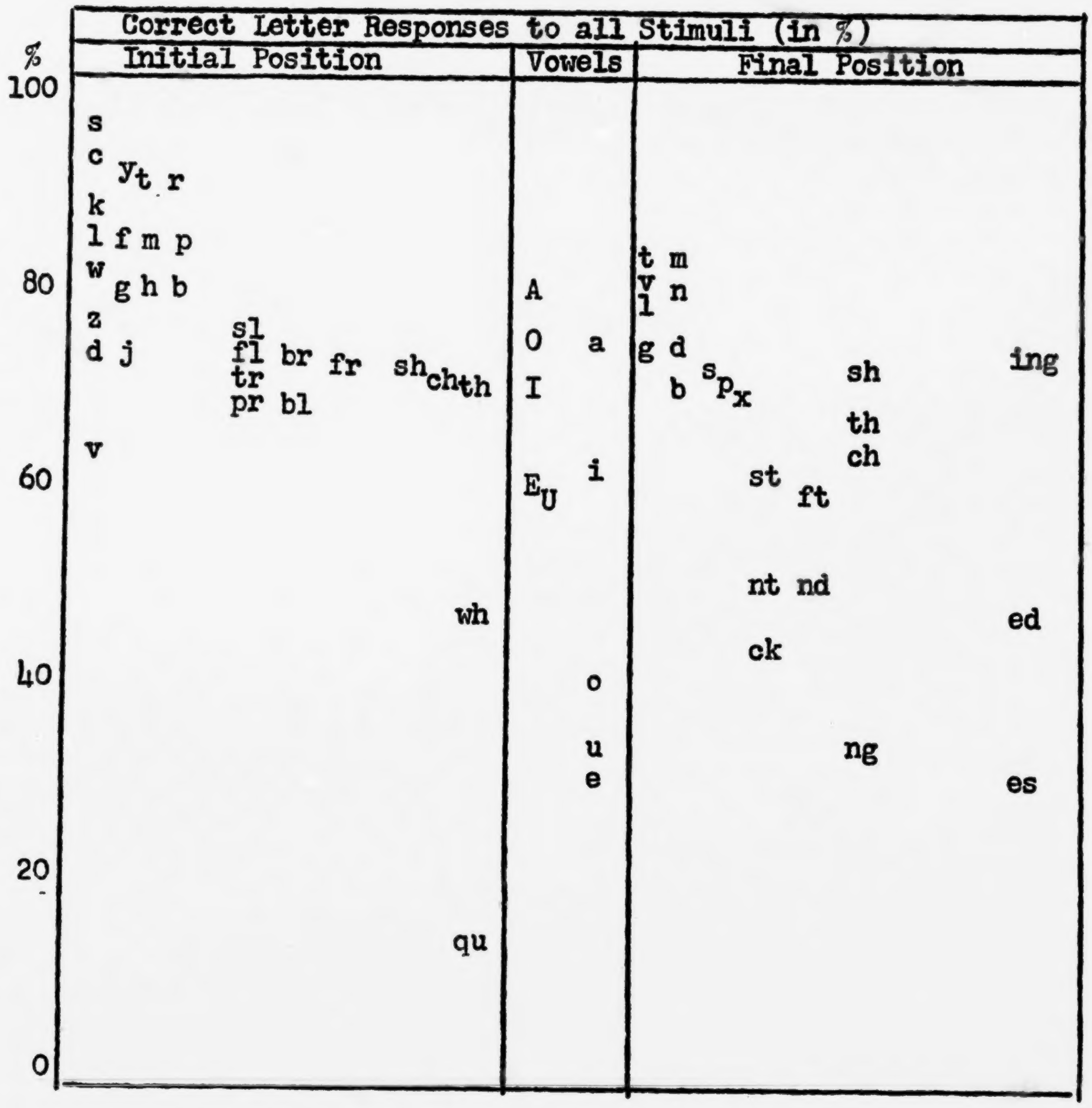
* Percentage based on 144 responses.

Table 21

Summary of Correct Responses



picture of major problems and can provide the basis for further studies using more rigid methodology.

Long Vowel Errors

Types Categorized. The kinds of errors that were made on the test can be divided as follows.

1. Another vowel (or vowels) is substituted for the correct vowel. This shows that at least the child has divided sounds into consonants and vowels and knows that some kind of vowel sound is

required. Certain of these vowel responses are closer to the expected response. For the /ay/ sound as in "pine" the child may hear /a/+/iy/ and write an a in the slot "p ne." Where the errors show a possibility of such a strategy, vowel responses have been separated into two categories.

Within the Type 1 category (incorrect vowel) "good" vowel errors as described above are labeled Type 1a, other vowel or vowel combinations become Type 1b.

2. When a consonant was inserted, it was labeled Type 2 if such a consonant appeared in the stimulus word. Thus the response "p" for the missing vowel in "pine" is a sort of preservation or graphic echoic behavior. The child doesn't separate auditorally the vowel from its surrounding consonants and so writes whichever consonant seems most prominant to him.

3. When other consonants, consonant combinations, or consonant-vowel combinations were written, they are labeled Type 3 errors. These seem to be random, at least on a logical basis, although perhaps not for the child. The letter h, for example, may occur because the child hears aspiration somewhere in the word and notices it to the exclusion of the vowel sound. It would seem, however, that a few children used a particular consonant letter as a kind of generic sign to indicate "letter," as one of the PL children did when he either inserted the correct letter or put x in the slot.

4. The last category was an omitted response and this is labeled Type 4. Here the children knew that they didn't know which vowel to insert. This type of error shows some learning, at least over Type 3 and perhaps Type 2 consonant responses. Appendix D-5 contains tables giving frequency and % of error for each long vowel letter by class and type.

Table 22 is a summary of the frequency and percentage of each type of long vowel error. The most common error for all classes is Type 1b (vowel or vowels = 57%). Type 1a (probable V) is next and is slightly higher than average for two of the "good" classes. Most of these 1a errors come from responding to the long E words with an e or e + V, and to the stimulus word "cute" with a w, v, or j. These three letters in Type 1a responses represent some portion of the /iuw/ sound of the vowel u.

Only the Urban children responded with a substantial number of consonant errors (Types 2 and 3) but in each class there were some instances of a consonant being inserted where only a vowel can go by English rules of phonology.

The PL-Rural class was the only one who made real use of the Type 4, or omitted response.

Table 22

Total % of Long Vowel Errors by Type & Class

Class	Type 1 1a %	 1b %	Vowels Total %	Consonants Type 2 %	 Type 3 %	Omits Type 4 %	Total Error %
PL-Suburban	29	57	86	05	09	--	8.7
VG-Rural	08	70	78	13	12	--	26.9
H-Suburban	13	79	92	05	03	--	20.8
S-Suburban	21	53	74	07	17	02	27.0
Av-Rural	16	62	78	07	09	03	55.3
Urban	13	26	39	22	29	--	54.6
PL-Rural	16	54	70	09	09	12	54.8
Average %	16.5	57	73.5	10	14	02.5	

We can conclude, then, that most children at the end of first grade can hear the difference between vowels and consonants and can produce a vowel letter where it belongs (distributionally) in a word even when that particular vowel letter is incorrect. One class, the "low" Urban class, has not yet learned this basic fact about spoken and written English (most likely hasn't mastered the sub-skills necessary to make these judgments, e.g., which letters are the vowel letters, how to write them, etc.).

Short Vowel Errors

Types. The same categories for errors were used for the short vowels as for the long. In cases where the child heard "reb" and wrote r b or rb, it was called an omitted response (Type 4). In most of these cases it was clear that the child heard a vowel but could not identify it. One other category has been added. In the Urban class, strings of letters appeared as responses to short vowels (e.g. fsown) as well as some non-letters (e.g. 10 or +). These were labeled Type 5 errors. Any vowel strings containing three vowels were included in this category. Appendix D-6 gives the frequency and percentage of errors by letter and by class.

Frequency of types. Table 23 summarizes the percentage of Short Vowel errors by type and classroom.

Again, Type 1a and 1b (vowels or vowel combinations) account for a high percentage of the error responses with the exception of the Urban children for whom this response accounted for less than half the errors. The Urban class wrote in one of the consonants in the stimulus word, more frequently than any other group, and also wrote strings of letters more frequently. The PL-Rural class had a

Table 23 (Phonics)

Total % of Short Vowel Errors by Type and Class

	Type 1		Vowel	Consonant		Omit	String	Total
	1a	1b	Total	Type 2	Type 3	Type 4	Type 5	Errors
Class	%	%	%	%	%	%	%	%
PL-Suburban	--	64	64	03	--	33	--	14.4
VG-Rural	02	91	93	01	03	03	--	42.0
H-Suburban	03	90	93	02	01	03	01	56.2
S-Suburban	01	80	81	--	--	19	--	49.3
Av-Rural	04	77	81	02	04	12	05	63.6
Urban	05	43	43	15	16	06	24	74.4
PL-Rural	02	67	69	01	01	23	05	67.3
Average %	02.5	73	75	03	03.5	14	04	

05% level of strings (these were three vowels usually) and also a larger number of random consonants and omitted responses (Type 4 and Type 3) than any other group. Omitted responses on the whole are much higher among all classes for short vowels than for long vowels and the choice of a stimulus consonant much lower. In each class but one, however, there were a few consonants inserted (Type 2 and 3) even among the "good" classes.

Comparing the short vowel responses of PL classes with the other classes shows that the PL-Rural class made fewer total errors than the other "low" class (67% vs. 74%) and were only 3 percentage points higher than the "average class" (at 63.7%). Their percentage of Type 1 or vowel responses (69%) was far better than the "low" class but still way below any other group. The PL-Suburban class either omitted the vowel or inserted an inappropriate vowel when they made an error.

Consonant Errors

Types. To categorize the errors by type, we considered how close the response was to the stimulus in respect to sound and looks. This approach produces three general categories:

1) phonological--close in sound;
2) graphic--close in looks; and
3) not related--different from the stimulus in both visual and auditory properties.

After preliminary examination of the errors, two more categories were added. One was called an "excellent" error. Into this category went responses that were actually appropriate representations of the spoken stimuli but did not follow the spelling convention, for example, the response kwack to the stimulus "quack." Another kind of response included under "excellent" was a correct response followed by an h. The addition of the h produced Sanscrit-like combinations such as bh, dh, etc., and we assumed this h represented aspiration. A few responses of the following type occurred: dash/dashe. These were considered "excellent" as well. The "excellent" category of responses allowed us to separate such responses from phonologically close but incorrect letters.

Another separate category included those responses which would have been correct had not the student added an extraneous letter (other than h), for example, tas/tast; these were called "correct t" errors.

In determining the error categories we realized that we were trying to second guess the child. There is no way of knowing what his intention was in giving a particular response--whether for example he misheard the sound and wrote a correct letter for what he heard, or whether he heard correctly but miswrote, or for that matter, just answered randomly. But if we were able to guess right, a preponderant number of errors should load on one or another of the categories we had devised and thus indicate a probable source of the error.

The ordering of categories was such that the same response could not be coded into more than one category. (A later analysis, however, considered overlapping semantic categories, when a pseudo word stimulus, for example, produced a real word response.) The list we finally used and to classify each error was as follows:

1. Excellent
2. Correct t
3. Graphically or Phonologically Similar
4. Graphically Similar
5. Phonologically Similar
6. Another consonant in the stimulus*
7. Not related to stimulus
    a. single consonant
    b. consonant string
    c. other: non-letters, vowels, etc.
8. Omissions

In deciding if an error was graphically (#4) or phonologically (#5) similar to the stimulus or both (#3), we used the following criteria:

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* There proved to be so few of these, the category has been retained only for initial and final consonants.

1. Graphically similar

h	f	l	x	n	g	g	h	v	m
↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
n	t	t	y	r	p	q	b	x	w

2. Graphic or phonological

b	v	m	s
↕	↕	↕	↕
d	w	n	z

3. Phonological. After much discussion among the staff, we asked for help in setting up a matrix. A linguist* worked out a system of first order and second order approximations to each stimulus sound.

First order substitutions differ from the stimulus only by voicing. In Figure XI they appear within the same square. Second order substitutions are those that have the same quality or manner of voicing and in Figure XI they can stand in a square to the immediate left or right of the stimulus sound (i.e., same manner, different position) or in any square within the same column (i.e., same position of artīculation but different manner).

Figure XI (phonics)

Linguistic Rationale for Phonological Error Categories. First and Second Order

Manner	Labial	Dental	Alveolar	Palatal	Velar	Glottal
Stops	p/b		t/d		k/g	
Affricates				č/ǰ		
Fricatives	f/y	θ/	s/z	s/z		h
Nasals	m		n		ŋ	
Liquid			L			
Glides	w		r	y		

key

c = ch

ǰ = ǰ,g,dg

θ = th(in)

ð = th(is)

š = sh

ž = VsV (pleasure)

ŋ = ng

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* Dr. Rose-Marie Weber, Modern Lang. Dept., Cornell

Although Figure XI provides a rational and logical way of analyzing errors with phonological properties close to the stimulus, it did not allow us to place a response such as *chibe* for *tribe* under the phonologically similar category, but forced us to call it unrelated. Responses, therefore, that we intuitively considered related in some way were added as exceptions. There were very few:

ʃ ⇆ d, č ⇄ t; θ ⇄ t . The exact responses allowed are listed in Appendix D-7.

The blends, digraph and suffix responses were analyzed for errors in much the same way as the initial and final consonants. Since more than one letter was involved, the Graphic Category was enlarged to include reversals (sh/hs) and the Phonologically Similar Category was enlarged to take care of both one and two letter responses. The added categories are given below.

Double letter responses.

1. one letter same; the other close (1st or 2nd order)
   brush / blush
2. one letter same; other not related
   brush / bsush; hang / haig
3. both letters close
   brush / plush
4. one letter close; other not related
   brush / slush; brush / psush

Single letter responses.

1. Same as first letter of stimulus.
2. Same as second letter of stimulus.
3. Close to first letter of stimulus.
4. Close to second letter of stimulus.

Total Consonant Error. The fewest consonant errors were made by the VG-Rural class (149) and next by the PL-Suburban class (179). Of the total of 2452 errors (28% of the total error possible) made on all non-vowel stimuli by all children, each class contributed as follows:

VG-Rural	06%
PL-Suburban	07%
S-Suburban	09%
Av-Rural	12%
H-Suburban	13%
PL-Rural	19%
Urban	33%

1. *"Good" errors.* Less than half of the total errors (946

or 38½% of all errors) were in logically motivated categories, i.e., were labeled Excellent, Correct +, First Order Similarity to the Stimulus, and in the case of more than one letter called for: Same as one of the letters--Close to the Other, Same as one of the letters-Unrelated to the Other; or in the case of a single letter response: Same as the First or Second Stimulus Letter. The individual groups of children differed from the overall percentage of 38½% for these combined categories as follows: (The Excellent subtotal for each group is also presented.)

	Total Good Error	Excellent Error	
PL-Suburban	62%	25%	of their total error
H-Suburban	56½%	15%	
Av-Rural	55%	12%	
VG-Rural	54%	18%	
S-Suburban	39½%	09%	
PL-Rural	34%	06%	
Urban	20%	04%	

2. Unrelated Errors. The error responses furthest from the stimuli by the terms we set up should perhaps occur in inverse order, that is, groups making the most "good" errors should make fewer of the "least good." This did not turn out to be true in all cases. In the following list, percentage of total errors made that were labeled Single Letter Unrelated to Stimulus, Other Unrelated Responses, Omits, are combined for each group.

H-Suburban	18%	of their total error
Av-Rural	20%	
VG-Rural	22%	
PL-Suburban	23%	
S-Suburban	35%	
PL-Rural	48%	
Urban	62%	

The PL-Suburban group made the highest percentage of errors categorized as "good" but did not make the least errors in the Unrelated Category. The four groups making 50% or more of the "good" error responses did, however, remain in the first division, so to speak, and the three classes having fewest "good" errors did show an inverse order in the number of their unrelated errors.

Although the PL-Suburban class had more Excellent errors than any other group, they did, however, contribute more to the total consonant error than the VG-Rural group (06% to 07%), but comparing the types of errors they made to the types of errors made by the VG-Rural class shows the largest difference between the two classes to be in the Unrelated category where the PL-Suburban children made 05% of their total error and the VG-Rural children made 16%.

There were other differences within the Unrelated categories. Both PL classes made more omission errors than the other groups PL-Rural, 19%; PL-Suburban, 17%; vs. Urban at the other end of the scale with 02%. (See Table 26 for a summary of all consonant errors.) The fact that the PL groups omitted a large percentage of responses--in terms of their total errors--than other groups suggests that some parallel may exist between production and reading. As discussed elsewhere in this report, the omission of a response in reading seems to indicate that a certain amount of learning has already taken place and the non-response (when the child simply stops at a word he doesn't know) is superior to a random answer. The same phenomenon may be occurring when a child is asked to produce a letter corresponding to a given sound. Thus the difference between classes, in omissions on this test is a very interesting one. It shows up in both PL classes and is almost absent in the Urban class. One could almost say that with greater frequency than is usual the PL classes are able to admit they don't know the answers. Although the greater percentage of omissions can have several different causes, we'd like to believe that one of the outcomes of the program in the PL classes was a realistic assessment by the individual child of what he did or did not know.

3. Phonologically and Graphically Similar Errors. Table 24 shows the percentage of phonologically similar errors of each group, and total percentages of each type of error within this category.

Table 24

Types and Percentages of Phonologically Similar Responses (in %)

	PL-Sub	VG-Rur	H-Sub	S-Sub	Av-Rur	Urban	PL-Rur	Total	
Single letter Stimuli								f	%
1st order	03	03	07	04	05	03	04	98	04
2nd order	01	08	08	09	11	07	08	184	07
Sub-total	04	11	15	13	16	10	12		11
Double Letter Stimuli									
a. Double let. resp.									
one same, one close	06	02	03	02	03	--	02	49	02
one same, one unrel	02	11	05	06	08	02	02	102	04
one close, one unrel	01	--	01	01	01	01	01	18	01
both close	--	02	--	01	--	--	--	8	005
Sub-total	09	15	09	10	12	03	05	--	07
b. Single let. Resp.									
same 1st or 2nd let.	22	11	18	17	20	10	17	376	15
close 1st or 2nd let.	02	--	02	03	01	04	01	63	03
Sub-total	24	11	20	20	21	14	18	--	18
Total %	37	37	44	43	49	27	35	--	36

Table 24 shows that a large percentage of the errors carried some phonological similarity to the stimulus. It is true, of course, that given the way the categories were set up, there was more opportunity for us to place responses post hoc into one of the phonologically similar categories when that response may indeed have been random. The preponderance of "same" letters in the Table, however, seems to preclude a judgment that the phonologically similar responses were really random.

Table 24 shows that a single letter response to a double letter stimuli is the most common error response and that one of the letters of the stimuli was most frequently produced correctly. Although not included in the table, the first tabulation of errors kept separate the position of the correct response. This separate tabulation showed that when the letters to be produced occurred in initial position, the correct single letter was usually the first (drip/dip) and when the letters to be produced occurred in final position, the single letter given correctly was the last (dust/dut). Since the largest number of errors occurred for multiple letter stimuli, the predominant type of error on these stimuli indicates that some understanding of the sound-letter correspondence existed and that the masking phenomenon was a strong factor in causing the omission of part of the stimuli.

Table 25 presents the percentage of errors which seemed similar graphically or could be either graphically or phonologically similar to the stimulus. These percentages can be compared to those in Table 24. The low percentage of graphically similar errors suggests that even after only one year of instruction, the child has learned to discriminate visually, but still may have trouble perceiving differences in sound. Both the Urban and the PL-Rural children had a lower percentage of graphically similar errors than any of the other groups tested. It would seem that these less able readers would have had more rather than fewer confusions of this type. (Their frequency of errors of all types was higher than the other groups but not necessarily their percentage on any one type; thus we are speaking here of relative proportions of errors.) Since there is no internal evidence (such as the "sames" in the phonological

Table 25

Phonic and Graphically Similar Errors

	PL-Sub	VG-Rur	H-Sub	S-Sub	Av-Rur	Ur-ban	PL-Rur	Total	
								f	%
Graphic	03	06	07	06	04	03	04	106	04
Graphic or Phonic	08	08	07	05	07	03	03	122	05
Total %	11	14	14	11	11	06	07		09

category) to show that graphic similarity of the stimulus letter to another letter actually influenced a given response, there is no way of showing that the children were actually operating as if two visually similar letters were one and the same. In a production task--as opposed to a visual discrimination task--a reader, even an immature reader, may not suffer this confusion at all. The inclusion of a graphically similar category of error seems not to have added much to our understanding of children's strategies.

Summary. Table 26 summarizes the errors by type and by group.

Table 26

Summary of Errors by each Group of their Total Error

	Groups							
Type of Error	PL-Sub	VG-Rur	H-Sub	S-Sub	Av-Rur	Ur-ban	PL-Rur	Types Avg. %
Excellent	25	18	15	09	12	04	06	12.7
Correct +	04	09	09	01	07	--	02	04.6
Phonologically Similar	37	37	44	43	49	27	35	38.8
Graphic and GR/Phonic	11	14	14	11	11	06	07	10.6
Unrelated	05	16	14	20	12	60	30	22.4
Omit	17	05	04	15	08	02	19	10.0

Overlapping Semantic Errors

Overlapping categories such as graphic and/or graphic and phonological pose a problem in analysis. Their consequence is that it is impossible to distinguish the source of the error, and therefore impossible to classify into discrete categories. The error could be mutually exclusive or inclusive, that is, it could be motivated by one or the other of the factors, graphic or phonic, or it could be motivated by both factors acting together, graphic and phonological.

Defined Semantic Error. For those complicating reasons the semantic errors were analyzed separately. We called a semantic error one where a real word other than the stimulus word was produced in a response. The stimulus word could be either a pseudo or a real word, (bend/bed, vap/sap). We judged a response to be a "semantic" error when it was phonologically a meaningful word, that is, the response did not have to be spelled correctly (vap/vaat, bend/beed). We did not include any word, however, in which the sound value of the stimulus vowel had changed (brush/bush).

Possible Causes. Reasons for changing a stimulus word to a real word are difficult to assess. A real word different from the stimulus may have been produced when the child thought he heard a different word from the one the teacher said, or the child misunderstood the task. In cases of pseudo word stimuli, he may have misunderstood the task to the extent that he thought the idea was to write a real word. Or perhaps, on hearing the stimulus word, the child wrote another word which he strongly associated with the auditory stimulus. If he knew how to spell his own word he would be more likely to write it and not a word he had never heard before (especially in the case of a pseudo word). It is also possible that the child made an omission error, thus producing a real word by mistake (bent/bet) or produced a real word when he substituted a graphically similar letter. It is impossible to say whether one or more of these conditions were at work to produce real words in the error responses. Whatever the cause, there were a large number of real words overlapping other types of errors.

Procedure. In the first tabulation of overlapping real word errors, Excellent and Correct + errors were counted. When this is done, by definition no pseudo word stimuli could produce a response that was labeled Excellent or Correct + and also be a real word, but almost all of the real word stimuli would produce real word responses (phonologically speaking) in these two categories. Since we wanted to see what semantic influence, if any, was operating when motivation for error was not so clear, the error types Excellent, Correct +, and Omit, were omitted from this analysis as irrelevant. Since error responses to Suffixes produced few real words in any of the responses, the Suffix category was also dropped.

Total errors amounted to 2452, and of these, suffix errors were 221. The Excellent, Correct +, and Omit errors for all other stimuli totaled 464. This left 1767 errors from which to look for overlap of real word responses. Table 27 shows the number and percent of real word overlap in each category of error, and for each type of stimuli.

Results by Type of Category. The results reported in Table 27 seem to indicate that semantic association does play a part in children's responses. For example, students produce real words in response to pseudo word stimuli in 46% of the errors, far higher than when real words are the stimuli.

When types of errors are considered, well over half of the semantic overlap occurs in two categories: that of first or second order phonological similarity to the stimulus; or a similarity that could be either graphic or phonic. Next is a 50% overlap with a consonant response that is not related to the stimulus. It is easier to conjecture about semantic influence when the responses are not otherwise related to the stimuli, but the high percentage of

Table 27

Semantic Overlap by Type of Error and Category of Stimulus (in %)

	Stim. Cate.				Sem.		
Type of Error	Single Pseudo	Cons Real	Blend	Digr.	Over f.	Tot f.	Avg % Over Error Type
Graphic	34	0	10	12	28	99	28
Graphic/Phonic	73	0	0	0	64	122	52
Phonic:							
1st Order	47	87	--	78%	62	97	64
2nd Order	58	40	--	57%	105	184	57
Double Letter Response	--	--	25%	12%	38	161	24
Single Letter Response	--	--	47%	23%	150	381	39
Single Cons, Not Related*	54	53	38	33	190	378	50
String, Other	02	0	04	13	8	345	02
					1645	1767	36%

* Stimulus Consonant included.

semantic overlap with responses that are also close phonologically to the stimulus word raises the problem mentioned before about whether these sources of error are working together or separately. Although some of the responses just happened to make real words, 36% of all errors just by happenstance seems too high. The semantic overlap was probably causing serious interference.

Results by Groups Tested. Table 28 breaks down the information in Table 27 for the individual classrooms. Percentages of overlap are given both for category of stimulus, and type of error. Within the cells, the percentages given are in relation to the total error produced in that classroom, the percentages in the total column and row on the outside of the table indicate what percentage of the total 645 real word error was contributed by each classroom, and how much of the total occurred for each type of error.

The fact that 36% of the 645 real word errors can be attributed to the Urban children and another 19% to the PL-Rural children means that over half the real word errors were made by the least able children. This may indicate that many of the real words just occurred randomly, or that less able readers are more prone to produce a word they are familiar with even if it is not being called for.

The fact that pseudo words as stimuli produced the highest percentage of real word errors among all groups, not just the lowest

Table 28

Semantic Overlap of Types of Errors, by Classroom (in %)

	Classroom							
Type of Stimulus	PL-Sub	VG-Rur	H-Sub	S-Sub	Av-Rur	Ur-ban	PL-Rur	% Overlap by type
Single Consonant (Pseudo)	58	43	54	56	46	43	43	--
Single Consonant (Real)	0	0	20	50	16	38	36	--
Blends	42	0	28	33	45	24	38	--
Digraphs	09	20	31	55	37	23	33	--
Type of Error								
Graphic	03	10	09	05	03	03	03	04
Graphic/Phonic	25	19	09	05	18	07	07	10
Phonic: 1st Order	13	10	19	08	06	07	12	10
2nd Order	0	28	17	22	15	16	15	17
Double Letter	22	0	09	11	12	0	05	06
Single Letter	38	05	21	22	32	19	27	23
Single Unrelated	0	28	16	26	14	45	29	29
String, Other	0	0	0	0	0	03	02	01
% contributed by each class to total	05	03	12	12	13	36	19	--

groups, may mean that we can trust a semantic explanation for error at least for this kind of stimulus. But the high contribution of real words in the phonologically similar single letter response (23% of the 645 errors) does not convince one that the primary association here was another real word, e.g., bed for bend but rather the simpler explanation that the child was not perceiving the next-to-last consonant as well as the last. The other error type with a high percentage of real word overlap is the response of a single unrelated consonant letter. Here, since randomness is the only alternative, one would prefer the semantic explanation. All in all, although a semantic association seems to be playing some part in the error responses, the data is not clear enough to make more than very tentative judgments about where and how much. Most probably the real word response is most relevant when the stimulus is a pseudo word or when the response is an unrelated consonant.

Summary

Correspondence tests given to seven groups of children who had made varying progress in their reading showed some correlation with reading achievement of the groups but not a complete parallel.

The PL-Suburban group made fewer errors on the vowel and consonant stimuli than their peers in the two non-PL suburban classes. They also made fewer errors than the VG-rural group of children when responding to vowel stimuli but were comparable or had slightly higher rates of error than the VG group on some of the consonant stimuli. Their percentage of Excellent errors was the highest of all groups.

The AV-rural group performed as well as those non-PL groups in the suburban school reading at a higher level. This suggests that "average" readers do as well as "good" readers when both have been given only incidental training (the suggested practices in the Scott-Foresman manual).

The PL-rural class performed comparably to the AV-rural class with stimuli for which they had had training, that is, those long and short vowels which they had been taught. Their performance fell between the average and the Urban class for consonant stimuli. Still, their rate of error on consonants depended on the stimuli and the extent to which it had been practiced in lessons during the year.

Both PL classes made a higher percentage of Omit errors (of their own total errors) than any other group. It was postulated that an omission indicates some kind of learning over a random response.

In general, those children making the most Excellent errors made fewer Unrelated errors and vice versa. Most digraphs were easier to reproduce than blends with some notable exceptions (see Table 21) and initial position brought more correct responses than final position. Vowels were of middling difficulty with long vowels easier to produce than short. The vowels a and i in either long or short sound value had the fewest errors among vowel responses while u and e had the most. The most difficult stimuli to reproduce successfully were the Suffixes and the easiest were the Initial Consonants, even though these last were inbedded in pseudo words.

When pseudo words were the stimuli, a large percentage of the error took the form of a real word, indicating semantic interference. Real words also overlapped that type of error labeled single unrelated consonant, indicating that simple visual and auditory associations cannot always be considered as independent of semantic ones.

The largest percentage of error was closely associated with a phonological similarity to the stimulus, especially when consonant blends (bl, br, etc.) were required. Many children produced one of the letters of the stimulus correctly and omitted the other. The letter omitted depended on whether the letter to be written occurred at the beginning or end of a word. Relatively few errors were assigned as graphically similar to the stimulus.

If this study is considered a pilot, a number of interesting questions present themselves. For example, a question can be raised about the usefulness of analyzing children's errors as a way into their minds. For allowing the child to produce at will and then looking for consistency in his free production is a time consuming task, far more so than checking right or wrong answers. To do so is to be convinced that there is extra merit in the procedure. It is our contention that many of the responses judged as errors in this correspondence test were motivated and not random. Further, by categorizing the large body of errors, it was possible to hypothesize a number of different strategies operating. It was not possible for us to separate some of these strategies one from the other, e.g., responses both phonically and graphically similar to the stimulus, but a further study may be able to do so. In addition, perhaps some future study might be able to order these strategies in a way we were only able to suggest rather globally, (e.g., an excellent error is superior to an Omit which is superior to a string of letters).

We are aware of the limitations our methodology imposed, and it goes without saying that any future study can surely avoid most of these. In any event, we hope the discussion of these results will arouse a curiosity about children's errors and how one can learn from them.

Chapter V

Handwriting

During the first curriculum writing conference very little time was given over to the discussion of handwriting per se. All were aware that children do not know how to write on entering first grade. Nevertheless, discussion centered not on how to teach the skill, but rather on how to fill the gap with other devices for communicating until children could manage to write on their own. Thus, for example, the typewriter was thought of as an important adjunct to the program from the very beginning. Providing word and letter cards for children to use in constructing messages also grew out of the summer discussions. We concentrated on providing motivating experiences to allow children to communicate in writing, and the implicit assumption was that transfer to these activities would be swift and painless.

It was decided to have children learn to form letters according to the system already in use in the schools, that is, the Zaner-Bloser system of manuscript writing. As with most first grades, the approved starting materials included newsprint, and thick pencils with soft black lead and no erasers. The newsprint was soon replaced (in approximately a week) by paper with lines spaced almost an inch apart with a guideline halfway between each line. These materials are selected for first grade writing on the theory that large muscle coordination develops before small muscle coordination. (Some Art teachers insist on large drawings for the same reason.)

First Year

That fall, although a few children seemed to have had prior experience with reading, their writing skills were non-existent. The teacher began by teaching the formation of letters, and those letters were immediately put into words and very simple sentences, e.g. It is old. All letters were introduced and practiced by the end of October. But the writing skill was by no means automatic at that time. It was disappointing that the first graders' progress toward effortless handwriting turned out to be so slow. Our ideas for the use of writing for a variety of communication activities had to be postponed. At this first stage and for a long time, it seems, first grade writing is slow, labored, and the letters are large and in some cases hardly legible. This seems to be the norm rather than the exception for first grade handwriting, however, and practice in handwriting was necessary throughout the year.

We learned from this experience. Teaching of handwriting is important in first grade and should not be left to chance. Our laisse faire attitude was inappropriate. This same attitude toward handwriting seems to prevail among many first grade teachers, and indeed if more time is needed for reading, numbers and the like, handwriting practice tends to get less and less time. The importance of the teaching, however, lies not in training the child to write with a fine hand, but in the reinforcing effect of producing letters that resemble those the children are learning to discriminate in their phonics and reading work. Casual teacher acceptance of letters written on the wrong part of the line or with the wrong orientation may even be strengthening the wrong bonds. Later, in a phonics lesson, the teacher works very hard to get the child to observe and respond differentially to minor visual differences in letters. She may be working overtime because she, herself, had allowed the child so wide a latitude when he was producing those same letters earlier in the day.

Second Summer

During the second curriculum writing conference, a sub-group was formed of those interested in finding a rationale for teaching handwriting. They examined current handwriting systems and discovered many inconsistencies. Data are meager on rationale for letter formation, size of letter, width of line, or kind of tool. Occasionally, a statement such as "research has shown" does occur in the literature but seldom with a clarifying footnote. Search for empirical findings proved fruitless. After working with several children at a Head-Start Project, it was decided that:

a. size of line could be ½ in. for initial teaching (much smaller than usual),
b. the size of the pencil (fat or thin) could be the choice of the child,
c. that some letters are "hard" to write no matter which way the child is asked to form the letter.

These observations were not meant to take the place of real research on handwriting but to give some cues for a practical program.

A handwriting program was prepared whose main objective was to get children to write legibly but not necessarily beautifully as soon as possible. This would allow production to operate as one more mode to reinforce other perceptual and cognitive learnings. The program contained the following features.

1. Letter forms

In general, letters were formed from top to bottom, left to right, and when possible, in continuous strokes without lifting the pencil.

Chalkboard practice and tracing with a pencil were omitted from the program but it was decided to try finger tracing of letters as an early procedure to help communicate both the form, the method for producing it, and to help establish rhythm in making a letter. After this brief practice, children immediately wrote the letter with a pencil. As soon as possible, letters were incorporated into words and words into sentences to help focus attention on spacing and to provide for integration with the reading and phonics programs.

Until handwriting skills could become operational, the committee suggested that children continue to use the typewriter (one at a time) and paste in pre-cut letters to communicate. Someone in the group knew where to find a simple printing press and, thus, for a second time, the handwriting problem led us to introduce another important adjunct to the total program. Inexpensive slates were also purchased for each child to practice on. These erase when the cellophane-like top sheet is lifted. Rather than cross out or erase (and tear the paper) the child could simply make the letter disappear if he wasn't pleased with it.

Besides exercises in letter formation, each lesson included optional extra activities. These were set up to provide a bridge to reading and phonics work that would be going on concurrently, and were geared to encourage the child to use his new writing skill as soon as possible.

2. Sequencing

The sequence of introduction of letters was based on the letter forms themselves, putting simple-to-form letters early, and grouping letters that were similarly formed. This sequence was then modified so that the first letters introduced in phonics would be taught quite early in handwriting. See Appendix E-1 for sequence of presentation.

It was decided that upper and lower case letters that are similar in form could be introduced simultaneously. The more irregular capitals were taught later. The children, however, would be exposed to the capital forms of all letters in prepared materials and be given identification and matching practice with the forms before they practiced writing them.

Second Year

The program was tried in both first grade classrooms the second year. Before beginning the program, the teacher asked the students to copy the following sentence from the chalkboard: "This year we will be reading many books." These copies were examined to see how well children could copy a model without training--to provide a baseline, if you will, for later comparisons. Sometime in February and again in May the children again copied the same sentence from the board. These copies were kept and given to the children at the end of the school year. Besides this sentence, a check list was made up and each child was checked from time to time on his production and his product. See Appendix E-2 for description of errors for check list form. Early notes on the Suburban children contain such comments as the following; for one child: "Doesn't observe line as base; runs words together; scribbles over errors; retraces."; for another "Writes name in Caps; starts letters of word on different lines; no idea of spacing between words."; and for yet another child, "Excellent in size, spacing and formation; bears down too hard on pencil." The check list also provided information on handedness. Two children in the Suburban school were left handed; five in the Rural school.

Handwriting lessons were dropped temporarily for the rural youngsters after the second week in favor of a program to help them distinguish and copy letter shapes. The Michigan Successive Discrimination Handwriting Program used for this purpose was very similar to a follow-the-dots game with a model as a sample at the top of each page; still, many of these children had trouble completing the exercises correctly. The rural children also practiced copying their own names, using a model taped to the left-hand corner of each desk. Each child received individual practice in formation of the letters of his name.

In the Suburban class, the prepared program moved along without serious problems. By the third week, 17 dittoes had been completed and by Columbus Day the children copied a group-composed story. At the end of the fourth week of school, PL lessons through #9 with dittoes through #33 were completed. The following letters had been practiced the first month in words and sentences: Ss, Oo, Ii, Ww, Tt, u, a, c, d. It was found that the regular PL program did not provide enough early practice on spacing between words. One or two extra dittoes were prepared to help with this--one was a sentence; "Tomorrow is Halloween." with an illustration at the top of the page. The next day the children copied from the board: "Today is Halloween. We can trick or treat." Earlier, the children had copied: "Today is October 13. We had a fire drill." The remaining lessons were examined and notations made in the teacher's manual in places where extra attention could be paid to spacing between words.

Rural

In the rural classroom, the Michigan Handwriting Program continued but the PL program was resumed after the first month with some changes in sequence. V, W were practiced and the sentence: I will. O and Oo were practiced and the word, owl. The sentences

It is a well. Is it a well? were copied and the children also completed the PL ditto, I lit it. which included a candle illustration to complete.

Children used the magic slates to practice almost every day since this was a highly motivating device. These slates were collected after each session so that they would last longer. We had estimated their life span to be about one month; they lasted the year. Other devices used in the rural school for Groups III and IV (about half the class) were making letters out of a clay rope before trying to write and name them, matching lower and upper case letters visually, and continuing games in letter naming and recognition, e.g. teacher presents A B C, asks child to name them, removes one letter and asks, "What's missing?"

Length of time to complete program

Before Christmas vacation, in the suburban class, all lower case letters had been introduced and most of the upper case ones; in the Rural class, all of the letters had been introduced and practiced. Both classes continued to have short, separate, review lessons on handwriting from time to time during the second semester. In addition, in the Suburban school, children were asked to copy a sentence or a short poem from the chalkboard once or twice a week.

Discussion

The PL handwriting program had proved successful in many respects but it moved too slowly in introducing the new letter-formations. The extra practice exercises that accompanied each lesson were sometimes too hard for some children to follow so early in the term, and would have been more useful later. Both teachers recommended re-organization of the sequence if the program were to be used again.

Testing-February

In February, a number of informal tests were given. In handwriting, each child copied a sentence that had been dittoed, and in addition, each child was asked individually to copy several letters so that the way he formed the letters could be noted. See Appendix E-3 for the group test, and Appendix E-4 for the individual test. These were letters whose formation in our program was notably different from the standard school program. Both the sentence and the individual letters were judged on acceptability according to various norms--alignment, spacing, etc.

Most of the students formed the letters the way they had been taught in our program and a large number of these were considered "o.k." i.e., in our judgment of more than adequate legibility. See

Appendix E-5 for frequency of various letter formations. But the decisions of acceptability wherever there was some question were on the side of leniency. Almost all of the letters, even those not formed the way they were taught, were considered "O.K." under the testing conditions. Most frequently formed another way were d and k. The fact that d was formed in a variety of ways suggests that the letter b, if tested, would show the same variability. It had been our practice during the year to accept variant ways of forming letters if the results were acceptable. One can expect, however, that the quality of the "O.K." letters would quickly deteriorate in everyday work. Daily work samples showed this to be true. Even so, the quality of letter formation had improved a great deal since September. Specific results are given below.

Rural School

Results of the sentence copying test indicated that 3/4 the class did not yet observe the convention of tall-short letters; 1/2 the class still did not always touch the bottom line when writing; 3/4 needed work with spacing between words and about 1/3 also needed work with spacing within words. Four children were considered to have a "shaky" line texture. In half of the instances, poorly formed letters were caused by misforming e and d.

Some problems evident in September seemed to have disappeared; this time only 2 children showed evidence of scribbling and there was no evidence of reversals (although reversals still showed up in the press of daily work.

As a result of this test the handwriting program for the Rural children in the second semester continued to utilize the magic slates, which had been very successful, and to stress correct letter formation with gradually more emphasis on spacing and relative size. This meant that most of the practice consisted of copying words and sentences rather than individual letters.

Suburban

Most letters were being formed by the children in the manner taught. Most of those which were not were judged "O.K." on the basis of legibility.

The sentence copying test showed that almost 1/3 of the children were leaving too much or too little space within words, and about 1/3 of the class had similar trouble spacing between words. Slightly more than 1/2 the class did not always observe the convention of relative size of small/tall letters, and about 1/4 of the class did not always place the letters correctly in relation to the line. Most of the letters were correctly formed, however, and in our judgment legibility of print was far higher this year than last.

Although our handwriting program had been completed about Christmastime, some of the exercises and practice sheets were re-used as further practice during the second semester.

Preference test

Attempts to experiment with pencil size and line size showed that most children choose an ordinary size pencil or a large size pencil inter-changeably without noticeable effect on the quality of their handwriting.* The children preferred to write within a larger space but the quality of their handwriting was as good when smaller spaces were used.

Testing-June

Two samples of handwriting were collected from six first grade classrooms including the two PL classes. Both involved copying tasks. Two dittoes were prepared. One contained a handwritten sentence taking up two lines which were spaced 3/4" apart with a dotted guideline half-way between the lines. The sentence read "The quick brown fox jumped over the lazy dogs." Underneath the model sentence were two 3/4 inch lines with dotted guidelines between. The children were told to copy the sentence in their best handwriting. The second ditto contained phrases as models. In this second ditto, the space between lines differed; and some phrases contained guidelines while some did not. Directly underneath each phrase, lines identical to the spacing of the model were drawn, e.g., if the model contained guidelines so did the lines underneath, if the model was 3/4 in. so was the space below. See Appendix E-6 for copies of the June tests.

Results

1. Sentence copying. Papers from all classes were identified on the back and then placed together for analysis and comparison. Our reasoning for the procedure was as follows: since "good" six year old handwriting is a relative thing, the more samples compared together, the finer the judgments that can be reached. Rather than set up a specific list of criteria first and judge each paper on the basis of how many of these criteria were met, the papers were first separated on gross judgments of good, poor, and neither good nor poor. Two adults looked through each pile and several papers were switched. The largest group, neither excellent nor poor, was then sub-divided into two piles depending on whether a paper had more in common with the good or poor papers.

* A box with the fat green pencils and regular yellow #2 pencils was handed out and children invariably chose the regular size pencil. Their reasons? It was different, it was yellow, it had an eraser.

Thus, four piles were made. Common characteristics of the excellent papers turned out to be as follows:

1. formation of letters matched the model closely
2. spacing matched the model closely
3. neatness--no doodling or crossouts
4. even pressure on the pencil
5. all letters touched the bottom line
6. no letter was omitted
7. no letter was re-traced

Common characteristics of the papers judged to be poorest were:

1. formation of letters imperfect
2. did not match the model in spacing
3. presence of doodles and/or crossouts
4. heavy pressure on pencil, shaky lines
5. letters did not touch lines
6. letters were omitted
7. erasures and re-tracing of letters

The middling groups contained some of the plus characteristics of the good papers and some of the minus characteristics of the low group. There was little or no evidence of reversal of letter forms on any papers (e.g. И for N or z for S), and none of the papers could be considered really poor. One paper judged to be in each category is reproduced in Appendix . The lowest group contains those samples which simply do not compare favorably with others in this particular sample. The number of children who appeared in each group is given in Table 29.

Table 29

Frequency of Good and Poor Handwriting Papers

		Group			
Class	N.	I	II	III	IV
PL-Suburban	22	5	9	6	2
VG-Rural	22	10	9	3	0
S-Suburban	21	2	7	5	7
H-Suburban	22	2	9	4	7
Av.-Rural	24	4	13	6	1
PL-Rural	20	4	3	7	6

The percent of children in each class judged to have papers in the first and second groups are as follows:

VG - Rural	86%	H - Suburban	50%
Av - Rural	71%	S - Suburban	42%
PL - Suburban	63%	PL - Rural	35%

The PL-Rural class did least well of any of the classes although individuals in this room had made observable progress throughout the year in motor control and legibility. Still, they were far from their goal (or rather, our goals) even at the end of the year. The PL-Suburban class did better than other children in the same school (H- and S-Suburban). In this particular school the first grade teachers we observed were very tolerant of a variety of writing styles at least through first grade.

Except for the PL-Rural class, for which there is no comparable group, the scores are probably directly related to the attention given to handwriting and teacher standards of acceptability.

2. Phrase Copying. Somewhat the same procedure was attempted with this ditto as with the first. The purpose of this ditto, however, was to see what size spacing between lines seemed to produce the best copy, and to see what influence the presence or absence of a dotted guide line had on performance.

The phrase most poorly copied by 35% of the children had a 5/8 in. space and no dotted guideline. Twenty-eight percent of the children did their poorest work on a phrase of 3/4 in. space and no guideline. The phrase best written was on 5/8 in. space and did contain a guideline.

In cases where two phrases were copied equally poorly it was the two phrases without any guidelines. The other two phrases on the ditto contained guidelines only part of the way across. About 18% of the children did poorest on each of these phrases.

Of the 98 children in this sample, 33 were judged not to have written any of the phrases less well than any other, but in all 33 cases the 5/8 in. space with guidelines was very well written.

Since the best and poorest writing was done with a 5/8 in. space between lines; since both models without guidelines were judged poorest; since performance when the guidelines was begun but not completed seemed to be half-way between performance with and without guidelines; it would seem that size of space between lines makes far less difference in the quality of Grade One handwriting than presence or absence of guidelines.

Summary

The PL handwriting program, in our judgment, improved the handwriting style and legibility of the PL-Suburban youngsters the second year over the performance of comparable youngsters the first year. Our hunch is that the major factor in the change was the added attention paid to handwriting the second year. The PL-Rural children also learned from the program but its introduction had to to be delayed and sequence somewhat altered for them.

We found that letter formation lessons should precede extra practice in integrating the production skills with other work going on in the classroom. These exercises should be saved for later, or used with just a few children at first.

We found that some Rural children needed discrimination training and many models before they could benefit from the more independent practice provided by the PL dittoes. Before each new letter is introduced in a handwriting lesson the teacher must be sure this letter can be named and discriminated from other letters. The writing of the letter must follow identification and recognition practice of some sort. If done in this order, producing the letter will serve to strengthen the association.

We found that the magic slates were of major use only in the letter formation stage, and, therefore, were dropped after a few months in the Suburban school but continued all year in the Rural school. These slates proved highly motivating to all the children.

We found that insistence on legibility and a system of forming the letters the simplest way seemed to be facilitating; that pencil size seemed irrelevant; that individual children differed in their preference for making large or small letters; that quality of handwriting improved when dotted guidelines were provided but quality of handwriting did not vary as a result of the amount of space between lines.

Chapter VI

Literate Environment

Turning the classroom into a "literate environment" for children means that exposure to language and reading related activities should not be restricted to periods of formal instruction. Since the six year old comes to reading instruction with an imposing array of language abilities, the instruction should capitalize on these. Moreover, if beginning reading skill is acquired not only through direct, formal instruction but also through informal contacts, then children should be provided with numerous activities and materials from the very beginning of their instruction.

This chapter tells about the informal methods we used, and the additions we added to the regular classroom environment to help develop language and reading skills, and to emphasize the communicative aspects of these skills. We will spend more time describing evolution of methodology for use of the tape recorder, typewriter, and printing press in the PL classes since these are not standard equipment in most first grades. Materials prepared to help children enlarge their oral and written vocabularies will also be discussed, and some of the free time activities provided for the children will be covered as well. After describing the activities and giving our opinion of which we liked, we will report results of a test in which PL and non-PL children got to choose the classroom activities they preferred. But before going into specifics, let's give a picture of the classrooms themselves.

Classroom Environment

There was more structure, control, and supervision in the rural classroom; both teachers seemed able to provide the groups with just the amount of structure each needed to operate effectively, and no more.

Learning Aids

In the suburban class, there were alphabet cards on the wall (right after school started, some were also put up in the rural class), a few puzzles, extra paper to draw on, and the chalkboard to write on in free time. There were also link-letters, a word-matching puzzle, and a color-wheel game. Several anagram sets were available and children used them to make up words and sentences of their own choosing or tried to duplicate sentences from a book.

In the rural class, two easals were set up with space for four students to paint, large blocks were available in the back of the room; there were beads for counting, simple jigsaw puzzles, and magazines and books to look at. The children found pictures in magazines and made their own picture book of words beginning with specific letters.

In both classes, other home-made games for matching letters, identifying colors and numbers, were used as well.

Displays and Techniques

The PL teachers had made joint decisions on many of the stimuli provided in the classroom. Therefore, there were similarities in displays and techniques. In both classrooms, therefore, there were: bulletin board displays, experience charts, slot charts, poems, displays of children's written and art productions.

Bulletin Boards

The following are examples of the use of bulletin boards in the two schools:

Suburban:
- a. Bouquet titled My Flower Bouquet with construction paper flowers of different colors each labeled with color names.
- b. Topical: turkeys at Thanksgiving, Christmas tree in December decorated with balls on which were written current reading words.
- c. Poems related to stories in reading groups.
- d. Pictures of fairy tale characters with the caption: "Do you know who this is?"
- e. Student work: drawings related to the farm, geometric forms titled, "We work with shapes," samples from the printing press, worksheets, handwriting, art work.

Rural:
- a. The Balloon Man, illustrated poem with construction paper balloons, each labeled with color names. (This was particularly useful because many of the children did not know color names, and needed to refer to the chart frequently.)
- b. Topical: pictures labeled, "This is a pilgrim." "This is an Indian."
- c. Science: specimens and legend: "This is milkweed. Look at the milkweed."
- d. Student work: Students dictated daily schedules. "We will go to art today. We will work hard. We will have fun." Self portraits with individual titles, e.g., "This is me." This is my name, ____."

e. Pictures labeled with numbers. Child chose one to write a title for.
f. Pictures from magazines of things starting all with the same letter.

Charts

Slot charts. These were used by teachers in both classrooms. They were approximately 28" x 40", and had 10 pockets which permitted easy insertion and removal of cards. They were valuable in the teaching of sentence building, phonics, and oral reading. Both teachers used the charts to teach the Teacher-Composed Sentences (Described in Chapter III). Individual cards were prepared for these lessons, e.g., "Today is _____." Cards were scrambled and rearranged to form new sentences or a number of cards were arranged in a sequence to tell a story. Much of the vocabulary in Swings and Slides was pre-taught this way. The children arranged cards with words from these stories to make up their own sentences, or they pointed out which sentence the teacher had just read. Punctuation was also pointed out during this practice.

We provided phrase cards in small display racks so that individuals could work in teams finding a number of different ways to combine the phrases into sentences. Later, these little slot charts were attached to envelopes containing words which could be combined to make many different sentences.

Occasionally, children in the Suburban school used the little slot charts to form sentences as a model for typing sessions. The observer used them for this purpose too.

Experience charts. A variety of home-made charts were made by both teachers, and many were dictated by the children. Science and Social Studies usually provided the stimulus. Teacher-made charts were used as teaching devices because they were designed for frequent review. Some are given below.

a. Helper's Chart, listing different classroom jobs, e.g. John will dust. The names of the children were replaceable. The teacher reviewed the duties on Monday and chose new children. During the fall, the chart was re-read several times during the week as well.
b. Calendar Chart, stating "Today is _____." The days of the week were on separate cards below. A child inserted a card each day and read the new sentence.
c. Weather Chart, with the frame "Today is _____." (windy, rainy, cloudy, snowy, sunny). The weather chart was in the form of a circle with the sentence beginning in the center and the adjectives on the rim. A moveable arrow allowed the child to manipulate as he read the appropriate

sentence for that day.

d. Attendance Chart, containing stick figures with the children's names printed on them. The title of this chart was "How many are here today?" Children removed a stick figure on a day that a child was absent, or added figures when necessary.

e. Word Families Chart, listing a phonogram (-at) at the top, and several rhyming words underneath. Children added their own words to these charts.

f. Poems illustrating rhyming words.

Magic Slates. Enough slates were purchased to allow every child in both classrooms to have one of his own. They were bought locally and cost 29¢ apiece. These were used mainly in the handwriting program and were an inexpensive and very effective way of getting children to practice their writing. They were sometimes used during the correspondence lessons, as well.

The suburban children tended to "fool around" with the slates more than the children in the rural school. Perhaps these "extras" were novel to the rural pupils some of whom did not come from homes where magic slates, magnetic boards, etc. would be common. The teacher in the suburban school allowed more autonomy in using these "extras," and the pupils displayed more independence in deciding what they wanted to do.

Tape Recorder

Originally, simple stories were taped in order to expose the children to good literature as part of their free time activities. Gradually, the tape recorder program was expanded to include activities aimed at vocabulary building, scanning practice, oral reading, introducing books to reading groups, and so forth.

Children's Literature Stories

Introduction by the Teacher. During the fall of the first year, the teacher introduced the children to the first tape recorded story. The whole class listened to The Five Chinese Brothers. After this, individual children, one or two a day, put on earphones and listened while looking at a book. No real reading was involved here but simply listening to a good story, and for a few children, beginning to see separate words and sentence punctuation. In the second year's try-out, The Biggest Bear was played to the Suburban class, and Albert the Albatross to the Rural class. Each year, in presenting these taped stories to the children, the teachers pointed out the print and pictures. The tape recorder (a Tanberg in one class, a Wollensack in the other) was set at a volume that could be heard by the whole class, and the teacher demonstrated the procedure of following the text and turning the pages when indicated by a click on the tape.

Choosing Books. During the first year's try out, the observer had noted difficulties with the very first story chosen. This helped give us an idea of what to look for in other trade books. The main criterion for selecting books in September, October, and November was the ease with which the print could be followed.

It seemed that the pacing of the first taped story did not allow enough time to look at both pictures and words. The text was quite dense (from three to ten lines per page), and non-readers would have trouble following this text. The next books selected usually contained one or two lines of text per page, and a small number of different words. In the taping, a longer pause was made between pages, and the reading itself was slower, although not to the point of losing normal intonation or story plot.

Supervision by the Observer. After the teacher had introduced the first story to the whole class, all listening activities were supervised by the observer.

In presenting stories to the children, the observer first showed the child the title and a few central words that recurred on many pages (such as good night in Good Night, Mr. Beetle, and millions in Millions and Millions and Millions). She then told the child to look for those words as they "read" the book. Next, the observer instructed the children to look through the book and try to reconstruct the story from the picture clues.

When the children began listening to the tapes, the observer helped them remember to turn the pages at the correct time. In the rural class, children needed help with turning pages well into the spring semester.

After the reading-listening, the observer occasionally asked questions to see if the story had been understood. The children were allowed to listen to the short stories two or three times, and for some of the easier books, the observer and child reread the book afterward.

Listening Center. By December of the first year's try out, seven "easy" stories had been taped for individual listening. During Christmas vacation, the tape recorder was adapted for multiple head phones, so six children at a time could listen.

Children were shown how to turn the tape recorder off when a story was finished, and the child nearest the recorder usually performed this function, freeing the observer from supervising the activity continuously.

After the multiple earphone arrangement was set up, as many as 12 children a day were able to hear a story on the tape recorder. In practice, the number of children listening each day varied. Several days each month the tape recorder was used in testing individual oral reading, as part of the PL data collection schema, and at one period a two-week pilot study in phonics was taped. Listening was also curtailed because of conflicting child activities, other duties of the observer, or an occasional machine or tape break-down.* Usually, children were asked to completed required seatwork before participating in any other activities. An exception to this rule was made for children who were so slow finishing written work that they would never have been able to listen otherwise.

Preparation of Tapes. In addition to the tapes we recorded ourselves, we sent for a tape of four stories recorded at Wayne State using several male voices. The Wayne State tape did not have a signal for page turning, so its use was delayed until a group of children were able to manage without this cue. By fall of the second year, thirty-six stories (See Appendix F-1 for complete list) had been taped by various speakers. For each taped story, at least six books were provided.

Adaptations of Procedure

Generally, no attempt was made to turn listening to story books into more than an incidental learning situation. Most of the books selected are considered excellent picture-books. It was felt that no matter what additional reading skills were acquired, the children would benefit from spending their free time with an interesting, well illustrated book. The earphone set-up simply allowed the children to concentrate on the book without the distraction of a normal busy classroom. We did try several pilot studies, however, to investigate the potential of the tape recorder in a first grade class.

A Model for Oral Reading. It was hoped that the children would benefit from hearing books that they could potentially read being read with good intonation, but a special technique was used during the first year to call this aspect of reading to their attention. A few stories were recorded two ways--first with a "monotone" voice, and the second with expressive intonation. Children were told to listen to both versions and decide which way they liked the story read. The observer, after listening to the children's opinions, asked them why they thought they liked it that way. It was found that children could easily say which way they liked to hear the story, but had a hard time expressing the reason. One said, "You sounded as if you liked the kitty better in this one." The observer helped the children to draw conclusions about good intonation.

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* In the long run, expensive tapes prove most economical, since they don't break at crucial moments.

These pairs of stories were not presented during the second year's try out. Good intonation was pointed out incidentally during oral reading activities, but not in a formal lesson because we felt the results of our little experiment did not warrant the time and effort involved. Perhaps a series of tapes prepared beforehand would be more successful in getting children to recognize some specific components of good oral reading, but even then, there would be no guarantee that this knowledge would transfer to production.

Ability to Follow in a Text

By the second semester of the first year, many children still did not follow the printed text while listening to the taped story. Even though listening to good stories fulfilled some of our purposes, new procedures were tried which we hoped would encourage children to look at the words. One book that had a question and answer format was recorded with only the questions and then a pause. The children tried to read the answer to the question themselves. Two stories were recorded with key content words omitted from the tape. The children were told to follow along in their books and try to say the missing words. Frequently, the observer sat with the children during these special recordings in order to stop the recorder and relisten to a page if no one could read the omitted words. One story, Is This You? contained instructions for drawing and labeling pictures at various points in the text.

Later in the year, taping of stories without a cue for page turning was another inducement to attend to the text. (It didn't work as well as other devices. Children who weren't already following the text couldn't care less whether there was a cue present.)

In the fall of the second year, special recordings of the stories, read very slowly, were made to give children combined practice in listening and pointing to the words in the storybook. Even so, we anticipated that no matter what devices were used, non-readers would not be able to follow the text word for word. For example, in October Hop on Pop was taped at a very slow rate. The observer in the suburban school estimated that about half of the 24 students could point to each word in the story. These were the students who were already beginning to read. The story was too long, however, for the activity not to become tedious after a while. In addition, it did not seem possible for children to listen and point at the same time unless they were very familiar with the text, and when that point was reached, the activity lost its major purpose.

Discussion. First, it was felt that if a child could follow the text at the same rate as a spoken voice, he *might* be led to begin scanning the line and stopping at punctuation. If this ever did happen, it was probably only among the better readers, since they were the ones who looked at all the words consistently, and whose automatic responses to the text were developed enough to be able to do this scanning.

Second, it was hoped that children's sight vocabularies might be expanded by hearing and seeing words a number of times. As has been mentioned, specific routines were designed to get children to look at the text in selected stories, but since this sort of story could not be done too frequently (because of the need for the observer's continuous presence), we are not optimistic about the number of words that were "learned" this way. However, we have some evidence that after listening to any story, children did feel able to try to read the book later at their seats, and could read some words they might not have read before.

In any event, all children heard and saw between 30 to 36 children's stories. The teachers did not curtail their own custom of reading to the children several times each week. The increment in hearing good literature is itself a worthwhile goal, and all other benefits, when they occurred, were greeted enthusiastically by the PL staff but still considered incidental.

Other Uses of the Tape Recorder

Whole Group Listening. The tape recorder was used a few times to "read" a story to the class. The teacher (or observer) showed the pictures in the book. The children were even quieter listening to a tape recording than when the teacher read to them.

Once, the tape was used as a script for slides shown in conjunction with the Coding Unit (See Chapter II). Response of first graders was good, unlike that of kindergarteners. This difference in attention is well worth further investigation.

Introducing a Book to a Reading Group. As one means of increasing high frequency vocabulary, the book, *Cats, Cats, Cats* (which contains such words as *big*, *little*, *thin*, *fat*) was played for each reading group while the teacher showed the illustrations. The group then read the book without the tape recording. Finally, children were given a dittoed copy of the text which they read together and took back to their seats to illustrate.

Improving Oral Reading. Each child was taped once individually, and once in his reading group. The purpose of this taping was to enable the individual to listen to himself read, paying attention to intonation, "natural" reading, and speed. Therefore, playback was immediate.

The children had different reactions to their voices on the tape. If they listened alone they usually paid better attention to and had greater interest in the way the tape sounded. But, if they were taped in the group and the playback was to the group, they were quite shy and some would leave the group rather than listen. Others would simply dissolve into embarrassed giggles.

We felt that more individual taping would have been profitable, and would recommend this procedure to primary grade teachers.

Instructional Stories. Stories that were to be read in reading groups and stories already read in a group were recorded and played for the children a few times during the first year's try out. The response to the review stories was negative, and children seemed very disinterested. This might have been because the book being reviewed was really less interesting than books ordinarily heard on tape, or because the children were just tired of this particular story. On the other hand, when tapes of the trade books were repeated with some children toward the end of the year, they were enjoyed almost as much as the first time.

Early in the second year's try out, in the Suburban class, Ladybird was recorded, and children asked to point to each word. Swings and Slides were recorded, and half of Group II and half of Group III listened on four different occasions. We could see no difference between the subsequent reading performance of these children and others who had not heard the story on tape. The slower children in the class, however, seemed to enjoy listening and reading after the story had first been introduced in a reading group. Nevertheless, no further taping of instructional stories was attempted in the Suburban school.

In the rural school, a short booklet based on several teacher-composed sentences was prepared in September and taped. The children were asked to circle specific words. Another tape was made attempting to teach six new words to the poorer readers, and a booklet which color coded the words accompanied the tape. The results were ambiguous. Of the four words tested at the end, the children averaged two correct identifications.

In the rural school, listening to a taped version of reading-group stories met with more success. All of the Chandler stories were taped, and children listened more than once both before and after their sessions with the teacher. This use of a tape recorder could easily become a routine occurrence in classrooms where children need extra practice, or repetition and where teacher-time is at a premium.

Story Telling. During the first year, we tried taping the children's own stories, and about half of the children in the class participated. We chose a familiar fairy tale, covered the text, and had the children look through the pictures in the book before telling their own version of the story to the observer. (The story was told to someone, not to the tape recorder.) These taped stories were transcribed and typed in primary type for distribution to the class. The children got to look at their own stories in print and to listen to their voices on the tape. Some read their stories to their reading groups or to the class. We felt the attempted rereading of the story was important even though not many could do it without help. In several definitions of reading is the implied or stated assumption that one should be able to respond to the printed page with the same results as if the language had been spoken, not written. This in turn implies that eventually one should be able to read anything he can say. When children could read the same words they, themselves, had spoken, it indicated that they had reached this stage. We were not presumptuous enough to think that all first graders would have such a high level of proficiency by June, but we wanted them to approximate this sort of experience anyway.

The children enjoyed this story telling immensely, and were especially fascinated by listening to their own stories on tape. We had hoped to be able to play a taped story back to the whole class after it had been transcribed and all children had copies, but the background noise during the taping precluded doing this. We continued the story telling activity the second year. All children in both classes told a story at least once during spring semester. Stories were taped one at a time in a corner of the classroom away from other children. The observer went over the stimulus material with the child first and, when necessary, helped him decide what to say and in what sequence. When the child felt he was ready, he told his story. Although a few children were shy and tongue-tied on their first attempt, they were always very pleased with what they had produced.

1. Familiar Stories. The most successful and popular stimulus materials in the suburban class were three easy books with stories familiar to the children, The Three Bears, Albert the Albatross, and The Ugly Duckling. The print was covered up in these books ahead of time. The child could use the pictures as a memory guide but was free to be creative as well.

The taped story that resulted was put to one or more of the following uses:

1. It might be played back immediately to the speaker or an audience (there were sometimes kibitzers around).
2. It might be transcribed into print and used as a read-along for a whole group or as a reading passage for the speaker. (This was the most frequent use.)

3. It might be typed out and then read back into the tape by the speaker to be listened to by several students at a later time. (Only a few students could do this.)
4. Copies of the dittoed transcription might be distributed to the class.
5. The transcription might be used on a bulletin board display.

In the suburban class, the sentence construction, sequencing of events, vocabulary, and general sophistication of language are reflected in the following excerpts from a few taped stories.

One child's introductory statement read:

> In a house in the woods there lived three bears: a father bear, a mother bear, a little bear. The mother cooked some porridge and it was too hot to eat. So the bears went for a walk.

Note the typical stylized fairy tale introductory sentence--the compound sentence--the use of the word so with exactly the correct meaning.

The stories contained some creative touches, some small areas of originality.

> She wanted to sit down, now. She was awfully tired....But suddenly she heard a crack! The crack was from the chair...

In the Rural school, the sentence structure was less sophisticated, in general, but still showed imagination in many cases. The following sentences are given as examples.

> Father Bear is playing with Baby Bear.
> The three bears are dancing now.
> She /Goldilocks/ said, "Mother, I'll never go out of the house again.
> When Goldilocks was home, her Mommy kissed her.
> ...she sat in the Baby Bear's, and pow she went!

We felt that certain renditions revealed a particular child's psychological difficulties. Since we knew each of the children very well, we may have been "reading in" more than we should have. We made no attempt, therefore, to analyze story content for such implications, but it is not unlikely that one properly trained could do so. For example, a child who seemed to be in a world all his own for most of the year added many more personal references in his story than any of the other children. As just one instance, he referred to the bears as "the daddy and the brother" and not Father Bear and Baby Bear as all the others had.

Several language deficits also showed up in the transcriptions of the Rural class. Either a language or a cognitive deficit is evident in the following excerpt in which the child identifies and labels pictures rather than telling a story.

> Now, Mother. Cooking. Porridge.

Some children's transcriptions showed their inability to divide utterances into separate words. This difficulty is obvious in the retelling of *Albert the Albatross* by a rural school child.

> Now everyone can't see albatross. He's flying, he's flying, and then i time to land. Hezow that window and he's lookin at the birdie...and then he flied out of there.

Aside from *i* for *it's* and *hezow* for *he's out* there's another omission in the story quoted above. Maybe the word albatross should be capitalized as the name of the bird, although all the children presumably knew the bird's name was Albert. Thus, *albatross* is not preceded by an article but *birdie* is. Variability in the use of determiners among these children was evident in other oral situations.

An example of the trouble some of the Rural class had in organizing thoughts into coherent sentences is exhibited in this excerpt: [Note the (incorrect) use of the word *so* in this last sentence.]

> One little pig. Two little pigs. Three little pigs. So they went off to build houses.

The child who told the story just quoted improved as she continued. When she got to the third pig, she said,

> The next little pig built his house with bricks. And the wolf came along and he said, "Let me in, little pig."

The variability between and *within* individuals in this class to use fully formed sentences made us wonder how or even whether to deal with the phenomenon.

When renditions of the same story in the rural and suburban class are compared, some large differences appear. Here are excerpts from three stories told about the *Ugly Duckling*. The first two are from Rural school children.

> There were three little ones and one big one. The mother one came along. she sat on the little ones, the three ones hatched but the big one didn't. [*ones* here refers to something present in the picture--a clear referrent to the child]

> There were three eggs in the nest. Little eggs. But there was one big giant egg. There were four eggs altogether... /vocabulary is much more developed than in the rendition above, but still essentially picture labeling./
>
> Once there was an ugly duckling. He wasn't alive yet. He was in an egg. There were three other little eggs. The mother duck came home. She saw the four eggs. She noticed that one was bigger than the others. Then, Mother Duck went to the nest. She sat on the eggs. Then, three of them cracked. Then the other one--the one that the ugly duckling was in--hatched.

2. Unfamiliar Pictures. The single picture stimulus elicited much better responses from the rural children, in general, than the longer, more complex stories. When single pictures, or sets of pictures dealing with similar activities, were introduced as an easier alternative to the picture book stimuli, the observer began to expand the children's utterances in the pre-taping conversations, and to encourage imitations of the expansions. Far more direct teaching and modeling was done at this point, than had seemed necessary in the Suburban school.

Considering the low level of conversation in the informal classroom situations, the Rural children did quite well in telling simple original stories from these pictures. Here are parts of some stories told by children in response to a set of pictures about children's activities.

> Jack sells newspapers and the people buy them. Jack puts the money in a jar. He went to the store to buy a ball. He played baseball. Jack looked at the apple. He buyed it. He buyed another. They all gone. Then, he throwed it away. He buyed a piece of bubble gum. He blowed it and blowed it and it popped.

3. Discussion. Most of the original stories were taped during the second semester and quite a few were completed after spring vacation. Most likely, this delay was not necessary at all. In the case of the Suburban youngsters, their ability to re-tell a story coherently indicated they had been ready to begin earlier, and perhaps go on to more complex tasks, or at least a wider variety of such tasks by second semester. In the case of the Rural youngsters, the story re-telling brought to light many language deficiencies that earlier practice might have ameliorated.

Use of a tape recorder for story telling in first grade was one of our notions which we think has many possibilities. We hope our pilot studies will be an incentive to others to build a fuller program along similar lines.

Typewriter

Primarily, the typewriter was to serve as a novel medium with which the children could try their knowledge of reading and writing. That is, they could write notes, messages, or stories on a typewriter more rapidly and with more precision than writing by hand. This is especially important to children with poor motor coordination. Slow handwriters tire before they have finished writing what they want to say.

We found the machine to be useful for certain pre-reading tasks, too. During the course of the two years, we worked out a number of exercises for letter matching and letter naming, to reinforce other teaching going on at the same time.

The typewriter we chose was a Smith-Corona Electric portable with bulletin type. The Smith-Corona Company kindly lent us a typewriter for two months during the first year while we were making up our minds. By September of the second year, the second typewriter we had ordered had not yet arrived and the one typewriter available was placed in the Rural school. Two months later, the suburban school received theirs.

Teacher and Observer Use

The teacher and the observer used the typewriter to produce class stories, worksheets, home-made books, and test materials. During the first month of school, the observer used certain exercises to help evaluate the children's knowledge of letter names.

Procedure

The typewriter was located on a separate desk at the back of the classroom. The same procedure was used both years. The observer wrote four or five names each day on the chalkboard. Those children listed used the typewriter for approximately ten minutes, with some leeway for finishing up. The observer kept track of the time. When a child finished, he went up to the board and crossed off his name as a signal to the next child that it was his turn.

During his first turn, and for as long as necessary thereafter, each child was shown how to insert the paper, turn the typewriter on and off, and the use of special keys, such as the space bar and shift lock. From the beginning, it was made clear that the typewriter was a tool to work with and not a toy. We needn't have worried about children getting bored and just "fooling around;" this never happened, perhaps because the tasks were intrinsically motivating and had many "play" aspects.

The observer suggested activities, worked individually with some children, took notes and evaluated each session.

After a few weeks the keys were covered with lower case letter forms, because these were the forms currently being taught and some children did not yet recognize capital letters. During the second year, the keys were covered with lower case letters from the beginning. In the rural class, ten letters were displayed at first; the rest were covered with blanks. This was done to reduce the complexity of searching. Gradually, all lower case letters were displayed, and finally the labels were removed entirely (about Christmas) revealing the original capital letters.

Typewriter Tasks: First Year. The type of activity suggested by the observer to the child depended on his level of reading skill, his previous activities at the typewriter, and the notes and recommendations which were kept on each child's turn. We made an effort to give each child some continuity and review as well as variety during his typing time. Therefore, he was usually given a choice of several activities, but was free to pursue an interest of his own if he liked. The following list of activities were the ones most often done by the children during the first year. They are listed in approximate ascending order of difficulty.

1. Matching letters: Children were given a ditto on which a number of letters were typed. The task was to duplicate the line of letters by finding each letter and typing it underneath the model. Sometimes, children would type a line of lower case letters, and then, using the shift lock, type the same sequence of letters in their capital form. This helped to reinforce pairing of the two forms.

2. Letter identification. The ditto on matching letters was also used to give practice in identifying letters and naming them. The letters on the ditto were the ones which the children had been studying in their phonics lessons. In this activity, as he typed each letter, the child would be asked if he knew the name of that letter. The letters which each child did not know were noted, and frequently the observer would review those letters again, or ask the child to name them as he retyped the line in capitals.

3. Typing own name. For children who knew very few letters and had trouble matching letters, the observer would type the child's name at the top of a piece of paper, since presumably the letters of his name would be more familiar to him than any others. Then the child would match and learn the names of the letters in his name. This was a particularly motivating and popular activity. In addition to typing their names, all children were encouraged to finish the sentence often typed at the top of their seatwork papers: My name is ___________.

4. Copying single sentences. Some children had trouble copying sentences from books or bulletin boards because they could not retain the image of the letter in their minds long enough to look away from the book and search for the letter on the typewriter. Looking back and trying to find the place in a single word was also difficult. Therefore, the observer typed a sentence dictated to her by these children and then they copied the sentence, matching letter to letter, much as they had done on the Letter Ditto.

5. Copying sentences, paragraphs or stories from books. From September to June some children liked to type pages from their favorite books. Although not as creative as others done later, this activity was more difficult than the ones mentioned above. Increasingly children were able to look at the word once, and then type out the whole word, or even several words at a time. This task also helped some children realize that words are bounded by spaces and that some words contain smaller units within them.

6. Copying arrangement of phrases on slot chart. Children were given a slot chart and phrases from their reading book that could be arranged to make a number of different simple sentences. They were told to make a couple of sentences and then type the one they liked best. One such sentence typed in the fall of the first year was: Jane is in the shop and Peter is in the shop.

7. Use of picture dictionary. A picture dictionary was kept in the desk on which the typewriter was placed. Children sometimes used it as an activity in itself, copying "b" words or making up sentences using "b" words. Other children used the dictionary as a reference for looking up the spelling of words they did not know. To get children used to looking at the picture dictionary, two sentences were dittoed: "Here is a big s_____. Here is a little m_____." Children could insert any "s" or "m" word that made sense.

8. Sentence or story completion. At the end of November, four different incomplete "stories" were dittoed. (Most of these were composed of words the children had had in their reading.) Children were helped to read the first part of the story and were then encouraged to make up an ending. An example of one incomplete story and the child's completion of it is the following: What do you want for Christmas? I want a toy train, a toy truck. (The underlined words were given to the child.) The observer often typed questions to the child and encouraged him to type out his answer. An example of this is the following interchange: What is your name? My name is Richard Drake.

9. Original writing: Many children, especially the better readers, were encouraged and, in fact, did, do more independent and creative writing. Some children typed messages to other children, some typed poems or stories--original, memorized, or copied--

and others typed out their parts in the school play or wrote letters to relatives.

One child composed a verse and typed it:

As I went walking I saw a cat.
She said meow meow and then she sat.

10. Labeling pictures to prompt children to write more creatively, ambiguous but funny line drawings were made up by the observer for the child to identify and describe. One child typed: A dog wanted to play dressup. To the same picture, another child typed: They are animals trying on hats. Responses to other stimulus pictures included: This is a design with four stars., This is a circle that never stops., Here is a woman with long hair all over the world., A bear and a duck were swimming in the sea.

Revising the Procedure

On the basis of the first year's experience, we made the following decisions: For the first two or three months, the children would benefit more from specific exercises, since free typing right away proved to be more difficult for the children than anticipated. Dittoed work sheets were devised for the first seven times at the typewriter, excluding the very first time. It was agreed that the children be given the worksheets routinely when it was their turn at the typewriter. If a child came up with an idea of his own, however, the sheets would be set aside, or used as supplementary to the child's idea. After the first seven exercises, children would be encouraged to do more independent work. Notes and recommendations would be kept on each child's work, and if necessary, more worksheets would be made up. Even though the children were given a choice of several activities, they were always free to work independently.

Typewriter Tasks: Second Year. At his first turn, the orientation procedure was the same as had been worked out the first year. In addition, we encouraged a child to engage in a brief typing activity that would result in a product at the end of the session. The child was permitted to type whatever he wanted to, but if he seemed to lack direction this first time, the observer was instructed to do one of the following:

1. Suggest he type out his name and show him how by typing it first.
2. Show him a pre-typed card of letters and ask if he can find them and type them.
3. See if he can name each letter as he types it.

After this, all of the letter keys were covered with blanks, except for l, i, w, t, o, c, d, m, s, a. These letters were the first ones introduced in the handwriting and correspondence programs and children had the most experience reading words composed of these letters.

Listed below are the typewriter activities used the second year.

1. Matching letters. A worksheet was provided on which sets of three lower case letters were typed in a large box. Children tried to find each letter on the keys and type it in the same box the sample was in. Again, children would complete the task, and then want to type the same sequence of letters in capital form. We thought this was a fine activity, time permitting.

2. Letter identification. This ditto gave practice in identifying and naming letters. The letters on the ditto corresponded to the ones which the children had been studying in their phonics and handwriting programs. If there was time, the observer asked the child if he could make a word using the letters on the ditto. The letters which each child did not know were noted by the observer. It was immediately obvious that a number of children in the rural school were confusing the letters b and d. These two letters presented problems in the phonics program too. (Provisions were then made to concentrate on auditory and visual discrimination of b and d in the phonics program.)

3. Copying words: (Picture clues) A ditto was prepared which required the pupils to match words on top of the page with pictures on the side. The child was instructed to type the appropriate word next to the picture.

4. Copying single sentences: Either the observer typed a sentence dictated to her by a child, or provided a worksheet with 2 or 3 sentences. The children tried to type the sentences underneath the model.

The space bar, shift key, and punctuation marks were reviewed beforehand. Help was given in reading the sentences if the pupil did not attempt to read them spontaneously.

5. Incomplete sentences: These were presented, and the pupils were instructed to finish them, and then type the entire sentence, either under or next to the sample. The missing words appeared at the bottom of the page. Some of these model sentences were typewritten, others were printed in manuscript. The manuscript capital letters were approximately one inch and the small letters were one-half inch high. The manuscript print decreased in size as the year progressed.

6. Copying phrases from slot chart, bulletin board, or

magnetic board. Children in the suburban school started to write words and sentences right away. Little time was spent in the letter identification exercises, although some children were given the letter-identification dittoes to do. For example, children copied sentences from books, the blackboard, bulletin board, magnetic board, etc. In November, one child at the suburban school wrote his name and then copied the following sentences from various places around the room, using good spacing and correct punctuation.

"Thirty days
Has November
Thanksgiving is one.
We like to remember.
Dad is sad.
Sam is mad.
The dog is sad.
Sam is mad."

A child from the rural school copied the following sentences from a chart. "I can see a pig. He is very big. He will run and run. It is lots of fun."

7. Copying from books: For reasons mentioned earlier, this activity is difficult for first graders. Nevertheless, some children attempted copying from a book both years. For example, in February, a child in the suburban school copied a few sentences from Tim Tiger Learns His A-B-C's.

8. Use of picture dictionary. A picture dictionary was kept on the typewriter desk. Children sometimes used it as an activity in itself, copying words or occasionally writing sentences. Other children used the dictionary as a reference for looking up the spelling of words they did not know.

In December a child in the suburban school used the dictionary to write these sentences, in response to a ditto titled, "This is a Story About Me,"

I am a knight.
I am a king.
I am a witch.

At approximately the same time, a child in the rural school copied these words from the dictionary: watch, woman, butterfly, horse, umbrella, Easter, egg, doll, dress.

9. A harder type of sentence-completion ditto presented an incomplete sentence which children could finish any time they wanted. They got help in the reading if necessary, and were encouraged to make up original endings. The picture dictionary was a big help to

some children in completing this task. Examples from the suburban class are given below. (The underlined words were given to the child. Errors in punctuation and spelling have been retained.)

Here is .... my czt. he is brown and white.
I am .... a good reader.
I'm going...home from new york on a bus.
Do you ....have a green volkswagen? i do.
Do you ....know how to ride a bike.

The observer sometimes typed questions to a child and encouraged him to type out his answer, and occasionally the observer and children wrote messages to each other, e.g., "Dear Leslie, Thank you for the valentine. Mrs. S."

10. Original Stories. In March and April, the children in both classrooms were given dittoes with a picture on them and a sentence that said, "Tell a story." In response to a ditto with a picture of a pirate holding a shovel in one hand and a bag in the other, one child in the rural school wrote the following:

> "He is digging for gold. And the didn't find any gold. He was digging with his shovel."

Another ditto with a picture of a bird and a ring prompted the following response from a child in the rural class.

A bird and a ring.
a bird sall ring what is it.
The bird said what is it.
it is a ring

An example of a story in response to the same bird ditto written by a child in the suburban school is the following. (Again, errors in spelling and punctuation are the pupil's.)

> A bird saw a ring and he thought well I will take this ring and fly with it away And find whose ring it is. And he put it on and then he got redy to fly away and then be flu away ol over the world and when he foud whose it is and gave it to the one that had it once again.

This ditto really sparked some of the children's imaginations. Two other versions of the story are worth mentioning. They are:

a) Santa Claus brought a ring to the little birdy the birdy saw it. she saw the ring and she said tweet tweet she liked the ring...
b) A bird found a ring he thought it was an egg he picked it up and put it in his nest.

Early in the school year, in January, a ditto with the heading, "This is a story about me. My name is ________" was given to some pupils in the suburban school. Most of the children wrote a sentence or two. A few copied words from the dictionary. However, one child, an advanced reader who had known how to read at the beginning of first grade wrote the following story independently.

> i live in ithaca and i go to Belle sherman and i have one Brother and siser named Judy and Steve and i have a grene volkeswagen and i live in a apartment in fierview hietets /Fairview Heights/ and i walk three blokes to scool and back...

In May a pupil in the rural school (top reading group) wrote the following in response to the same ditto:

> I am big I am a boy I am thin I can run and jump. I have a cat and dog. red. My house is red I look like Todd I like Mark T.

At the same time another child in the same class with many learning problems was motivated to write:

> I am big.
> I am a girl,
> I am thin,
> I can run,

11. Writing letters. Children were encouraged to write messages to somebody in the class, or to their parents. If the child did not have any idea for a message he was given a "message" ditto, and told to pick one of the messages. Most of these messages were familiar to the children from the teacher composed sentences. Here are two examples of messages composed by children in the suburban class. (The rural class did not get around to doing this activity.) In January a child wrote:

> Dear Pall Prisilla
>
> I got my pitcier taken today.
>
> Love Leslie.

Another child wrote this letter in May:

> Dear Mom and Dad and Ronny and Gidi
>
> I am at school and I am writing to you from school I wish we were rich but we arnt so we will have to work so Mom works and works and wen you work you get money did you hear or shell

I shout in your ear...

Danny M. B.

Discussion

It is interesting to note that many children who would not sit down at their desks to write sentences or stories would do so at the typewriter. It may be that the children's interest later in the year in copying stories, and writing and illustrating their own sentences or stories at their desks, stemmed from their experiences doing these activities first at the typewriter. (In fact many children who asked to type a story when it was not their turn were encouraged to do it at their seats by writing instead of typing.)

Some children used the typewriter to complete work in other areas. Many of the children who used it in this way completed the answer sheets for SRA supplementary reading. A few children who were having a good deal of trouble with their handwriting refused to do the SRA supplementary reading because of the written work required after the reading. However, they were quite willing to do the reading when the observer suggested that they type their answers to the questions. The typewriter was considered the most worthwhile "extra" in the classroom. With a minimum of outside supervision and motivation, the children produced a great deal of worthwhile material. Children were able to work at their own level regardless of the activity, be it matching, copying, or writing original stores. The teacher at the suburban school once stated, "The children can't wait for their turn. They're so eager!" The same was true for the rural youngsters.

Printing Press

In the fall of the second year, we made arrangements to get printing presses for our classrooms. They arrived in December.

As an extra activity that allowed children to use linguistic skills, the press proved to be excellent. Children in both classes were fascinated by the process of printing.

Despite the fact that the type was a mirror of real print and also had to be fitted into the press from right to left, our predictions of utter confusion, particularly in the rural classroom, were wrong. Amazingly, children did not have serious problems, and were almost all able to use the printing press with varying degrees of independence. Children who had had trouble in September reading the alphabet in sequence from charts in the front of the classroom, could fit the letters backwards into the press in January (an amazing feat!).

Description of the Press

The presses cost approximately $100 each, and were made in France. The print was stored by letter in a wooden tray 10" x 36". The press, itself, was quite small and yielded a print 5" x 7". Over 500 letters and numbers excluding French characters and blank space pieces were available. We supplied various colors of washable water base ink at 50¢ a 6 oz. tube. This allowed the children to clean and care for the press themselves.

Child Use

The press was first demonstrated in late December by each teacher and then supervised entirely by the observer. The children, working in pairs, decided on their own message or statement; the observer wrote it out. All the work of printing the message was done by the two children: setting the type (usually with one child finding the letters and the other fitting them into the type holder); spreading the ink with a roller; inserting pre-cut paper in the press, making the prints, and cleaning up.

The observer stayed with the children long enough, in both classrooms, to see that they had started at the correct side of the type holder and were setting type in the correct direction. After the children had set the type, she again checked for errors and reversals. Even so, occasionally some errors were missed.

The children had some trouble regulating the amount of ink for the actual printing, especially in the rural class, but by the end of the year they produced acceptable copies.

By May, several children in the suburban class were able to use the press independent of all help. Because the procedure for using the press was so complicated, no special structured program was used. The children made messages or statements of various sorts. For example, since the printing press arrived in December messages such as "Merry Christmas. Happy New Year." were printed in both classes. The children in the suburban school varied this message. Some wrote, "Merry Christmas from Santa Claus and Merry Christmas to you all."

Comparison of the two classes. The suburban pupils were almost immediately able to print longer sentences, regulate the amount of pressure needed to print clearly without perforating the paper, and used the right amount of ink. They usually produced clean, clear, messages. This was more difficult for the rural children. More supervision and trial and error were necessary before they could print clearly.

Consistently, messages of the rural pupils show uneven inking and pressure, smudges, and some inverted letters. However, in spite of the difficulty these children had in mastering the activity, they remained enthusiastic and eager to print. The whole process fascinated them, and provided a novel opportunity to write sentences they probably would not have been motivated to complete otherwise. For example, in April two boys in the rural class, one of whom was in the lowest reading group, printed clearly the following sentence, "We will have fun We can run Hugh Peter."

In May, two other boys in the "high risk" reading group in this class printed, almost entirely on their own,

> We know hoW to Swing
> We can write

At about the same time, a child in the top reading group in the class independently wrote "I have some kittens." She then proceeded to print out the message with another child. They used too much ink and produced a messy paper, but were able to evaluate their production and ask for help to improve it.

Kinds of Messages. By far the largest number of messages in both classes were of the sort we termed "the mash note." Very simple and direct, they almost always took the form, "I love you /somebody7." In the first two months of use, half the messages in the rural school and about 20% of those in the suburban school were of this sort. After Mommy and Daddy, the teacher was the most frequent recipient of such notes.

Holidays, including vacations, came in for a large share of attention too. Examples of some that were printed in the suburban school, given below, exemplify another popular practice in that school. These messages were written in the form of letters, which, of course, had to be delivered. (Errors in the examples are retained.)

> Dear Mother and Father,
> I will give you a Valentine
>
> Dear Mrs. C.
> We hope you have a nice vacation over Valentines day!
>
> Dear Jeannie Happy Birthday. I
> hope you have a nice birthday.
>
> Dear Mrs. W.
> We hope you had a very nice April Fools Day. Love
>
> Dear Mom and Dad
> Soon it will be spring. There will be some April showers.

Next, in terms of frequency, were the informative statements. Examples of this kind from the rural class are: "We go to school all the time" "I like to paint." "I love to catch big butterflies." "I like to eat in the lunchroom." And from the suburban class: "We made faces out of paper a few days ago." "Our cousins are coming tomorrow." "Our cat isn't at home anymore I think She is having kittens." "I like Curious George It is good" Some of the suburban children's notes can be classed as informative as well. This one was sent to their last year's teacher in the kindergarten.

> Dear Mrs. R.
> It is a nice day for playing. I like
> school but Worksheets are a little too hard.

And one to the current teacher:

> Dear Mrs. C.
> I like to learn about
> space and I know how
> to spell atmosphere.

Some messages might look at first glance as if they should be placed in the category of informative statements, but were actually a use of words and phrases being studied in the reading or correspondence lessons. These were more frequent at first while the children were getting used to the printing press, but very quickly became infrequent. One such message stated: "I can go on the bike." Other schoolroom activities and projects were reflected sporadically in the printing. At one time, the suburban class was studying the farm in social studies, so for awhile a great number of sentences printed had to do with some aspect of farm life or farm animals.

The last major category was not spontaneous but teacher directed.. On several occasions invitations were sent for some formal occasion, or a group thank you note was written, or greeting cards were printed. In the rural class, parents were invited to a special function of the PTA by means of printed notes, and in the suburban class, the children sent a formal invitation to their class play.

Discussion

As can be seen by the examples, the use of the printing press differed in the two classes. The messages printed in the suburban class were longer and the content more varied than in the rural class. For the most part, the suburban youngsters had less trouble learning how to use the right amount of ink and the right amount of pressure in making the print. In both groups, the spelling and punctuation were remarkably free from errors (although the observer almost always checked before the actual printing), and both groups printed a variety of messages. Adult evaluation aside, the children enjoyed the printing press activities very much.

As we see it, the printing press contributed by helping the children to see a practical reason to spell and space words correctly. We judge the printing activities were a direct stimulation to the composition of original sentences. And most important, it's use gave subtle emphasis to the fact that writing is communication, and reading is the receiving of a communication.

Language Development

Interrelationships

In a way all the activities in this Chapter and many cited elsewhere in this report facilitated language growth. In many cases these activities served a double purpose.

Reading. In the early stages of the reading program, the child's gradually increasing ability to arrange and rearrange phrases into new sentences is a case in point. The construction of answers to questions using a population of words he could already read, is another instance of language practice tied to a second purpose: review of early sight vocabulary. In each instance, the child had to rehearse the sentence mentally before being able to choose word cards with which to arrange an acceptable statement.

Listening and speaking. Activities already mentioned in this chapter in connection with the tape recorder, typewriter, and printing press involved several language activities. Use of the tape recorder for story telling was one of the major oral language activities for all children.

An activity similar to the taped story, but involving the whole class was initiated the second year. Use was made of records and filmstrips of popular children's stories published by Weston Woods. After a whole class presentation of the film and record, the book was added to the class library collection for a few days.

Whole class lessons in composing sentences were frequent, especially in the rural class, for example: "Is today Monday? No." or "Today we have art. Miss Neal is the teacher." At first, the teacher selected the content of the sentences, and helped give alternate ways of expressing an idea; later, children were able to complete such sentences spontaneously.

Another opportunity for interchanges among children, in which decisions must be reached and directions given and carried out, occurred while the children were printing messages. There must be discussion between the pair of children who are jointly printing a message prior to deciding what message to reproduce. Children in this situation also had to make decisions together about divisions of tasks and procedures at each step. The very fact that children not only made but actually delivered their messages, brought about another oral language activity. In the suburban school, two boys, delivering their own message to the kindergarten teacher, were asked to explain to the class what they had done. She reported later that they gave the five year olds a very complete, well organized presentation on how a printing press works. This led to similar presentations in other rooms in the building.

Audience situations were created in conjunction with several reading group tasks. The riddles which were read by a team of two or three children and then presented orally to the rest of the reading group is one example. Some of the presentations of the story telling sessions provided another opportunity. In the rural class, particularly, free dramatization of familiar tales by a few children for the rest of the class was especially popular and productive. In the suburban class, a class play was prepared and presented each year for the other classes in the school.

Teachers and staff together decided not to include in the program one of the more usual oral language activities in first grade, that of "Show and Tell." Instead, once in awhile, one or two children would tell the rest of the class about a book they had just read and liked (or perhaps disliked). In lieu of Show and Tell, there were frequent full class discussions with children contributing from their own places.

Speaking and Writing. In both classes, whole class lessons, whose major purpose was to stimulate the beginnings of written composition, used the strategy of the unfinished sentence. For example: "Did you know _____?" and "I looked out the window and _____." The class volunteered various ways such a sentence could be finished. Children frequently learned from each other about sentence structures which might not yet be productive for them, and also picked up some new vocabulary in the process. Only after such oral stimulation did the teachers ask the class to complete one of the sentences as a written exercise.

Special Exercises

Two sets of exercises were devised whose primary purpose was language development. One set was written the first year. We used parts of it again the second year, and added new exercises for the rural children to give them practice in answering in complete sentences.

Goofy Sentences. We made up sentences for each reading group (the low groups had simpler vocabulary); these got labelled "goofy sentences." They were either syntactically or semantically anomolous. For example: "Peter was so happy he began to cry." "How many is those?" Each day the teacher would write one or two of these sentences on the chalkboard and ask someone to point out what was wrong. Then the children would decide how to change the sentence so it would sound right to them. For sentences with syntactic errors, the teacher was instructed always to ask, "How can we change it so it will be something we can say?" With semantic errors the teacher was not to press for an answer if the children didn't volunteer something themselves. If she wanted to, she could show them one way of changing the sentence and then ask, "Now does it sound OK?" None of the children had any difficulty in transforming the syntactically anomolous sentences; the semantically anomolous ones seemed to annoy some of the children. These were usually dismissed with a "That's silly because...." Occasionally, a semantically anomolous sentence would produce a good discussion in which pros and cons were argued. (Part of the battery of September tests the second year included both semantically and syntactically anomolous sentences. Differences between suburban and rural children were high on these tests.)

Well Formed Sentences. We had been aware that children in the rural school did not often speak in full sentences (neither did the suburban youngsters, nor the teachers, nor does this writer). By the nature of the usual discourse in a classroom, children are almost always participating in dialogue that begins with "Who was ___, What is ___ When did ___." and their portion of the dialogue is most suitably a noun phrase or prepositional phrase which substitutes for the who, what, or when.

We noticed, however, that some of the rural children rarely spoke in full sentences even when opportunities were presented, such as the story telling. Since these same children had had trouble dividing an utterance into words, discriminating sounds within words, and many had not been able to identify structural deviations in sentences in the September testing, and several had speech production problems as well, we should not have been as dismayed and discouraged as we were in March at the results of the story taping. The sentence manipulation that went on in reading groups in which the children were given extended practice arranging words into sentences, and practice in completing unfinished sentences, had not transferred to their own conversation in an informal school situation. The story-telling practice from single pictures obtained much better results, but we decided this was not enough. In a better-late-than-never mood, we set up lessons to be used with the full group during April and May.

Procedure. The teacher spent five to 10 minutes a day on a small set of questions for which she required full sentence answers.

The children were accustomed to riddles and so this became the usual form of the question.

At first, simple questions about some aspect of the classroom were asked. "What is your name?" was one. The rural teacher demanded that answers always be in whole sentences, and at first demonstrated by expanding a word or phrase answer, and asking the individual to repeat it. These sets of questions were repeated so that more than one child would have a chance to answer. Then, a new set of questions was introduced.

The teacher called on a child who might be expected to use a complete sentence. After this answer, another child was called on to answer the same question. The second child called on ordinarily did not use full sentences. In this way, a model was present for him. After one run-through of the five or six questions, each of them was repeated and different children asked to supply answers. The questions were so constructed at first that the complete form of the statement was also present in the question. Thus, "Does Bobbie like to fight?" has only one change from like to likes and a deletion of does in order to produce an acceptable answer. Since it also allows more than one opinion, several children could reasonably be called on to answer the same question. (For the benefit of the curious, the consensus was that Bobby did indeed like to fight. Bobby filed a minority report.)

The form of the questions gradually changed so that the child was allowed to construct more and more of his own answers. More open-ended questions were presented that could lead to discussions, or at least a number of different answers, all of which were required to be in full sentences. One such was, "What television program do you like best?" Another set of questions dealt with why-because relationships, e.g., "Why can't you fly?" "I can't fly because...."

Finally, the question was preceded by a sentence or two giving information which had to be used in the answer. The teacher read a short paragraph to the children and then asked questions about it. For example, "A boy saw a little kitten. 'Come here,' he said. 'I will give you some warm milk.'" followed by, "What did the boy see?" "What did the boy promise the kitten?"

During this period we kept track of usage in the classroom and composed riddles and questions to give practice where we noticed deficiencies. Present and past tense of irregular verbs were one such instance (as in the see-saw example above); another was noun-verb agreement. The following are some examples of questions devised to meet these particular needs:

a. Passive; use of by. (Authorship of the children's transcribed stories was indicated by the usual phrase by+[Mary] .

Children took this to mean bye and thought the observer was saying goodbye to a particular child.) The children were asked questions similar to: "Who was the book by?" The transformation from the question to the answer of the sort "John wrote the book." was difficult. Help was given by beginning to answer the question, e.g., "Who was the room dusted by? Say: The room was dusted by...." and then allowing a child to finish.

b. Irregular past tense. The correct use of the past tense in sentences was encouraged with sentences such as these: "I can run fast. Today, I ran fast to catch my bus. What did I do today?"

c. Eliciting the proper use of has, have, got (children said gots).

d. Use of possessives. For example: "Whose blue hat is it?"

e. Changing verb forms, e.g., "Was I here yesterday?" (Yes, you were.) or "Am I your teacher?" (Yes, you are.)

Results. In May, this class was given the Sentence Anomolies Test from the September battery to see if any changes had occurred. Recognition of the anomolous sentences had improved a great deal. One would hope that the insistence on production, even though too little and too late, had proved beneficial.

Free Time Activities

Since the teacher spent between 15 and 20 minutes with each reading group, in effect the children were without direct teacher supervision for an hour and a half on most mornings. This is the usual procedure in any system using reading groups. Children not engaged in reading with the teacher are generally given enough written work to keep them busy profitably and independently during the period. Although "seatwork" had been widely criticized as being "busywork," the problem of quality vs. quantity is a real one and not easy to solve. Teachers are constantly looking for a variety of materials that children can work on independently, and we were particularly interested in using this time for language arts activities that would not just keep the children busy but would reinforce and augment current learning, or allow a child to move in independent directions. The choice of free time activities in great measure resulted from our attempts to provide a literate environment. Some of these have already been discussed in detail in this Chapter. Others are presented below. (Where an activity was used only one year it will be specified.)

Assigned Written Work

Worksheets. Each day the teacher gave out and explained two or three worksheets; some for the whole class, e.g., an arithmetic or phonics paper; some for individual reading groups, e.g., comprehension questions on yesterday's story; or work on grammatical tags (noun or verb endings, etc.). Frequently, a fourth coloring paper with written directions was available to those who wanted to do it and had the time.

During the first year, some of the written review in phonics was provided by the Continental Press ditto masters. Quite a few of these were set up so that in a multiple choice situation the phonic cue alone provided the answer. The top group in the suburban class used this company's new Reading and Thinking Skills both years. This set of exercises included work in classifying words into subordinate and superordinate categories, working with analogies, and finding pronoun referents. Most of the work in phonics the second year was provided by the worksheets that accompanied the PL correspondence Program or by the subroutines which supplemented that Program. Quite a few worksheets for comprehension of stories were written by the teacher the first year. These were supplemented by staff prepared comprehension questions the second year, and in addition, a short set of special exercises were written to help children improve comprehension skills.

Sentence Completion. In December, the suburban teacher began writing incomplete sentences on the chalkboard for the students to finish as part of their written work. For example: "This weekend I...." "I would like...." Of the responses, the observer, a former first grade teacher herself, writes, "Sentence completion amazing--all sentences used have required only one word, but many children have used imagination to complete. Others use dictionary. A few in the top group compose three sentences."

After Christmas, children in the rural class were asked to complete sentences, too. The teacher began with such sentences as: "I will...." or "I can...." After oral practice together, the class was assigned to write their own individual completions. Sometimes the teacher in this class went to the trouble of providing each student in a reading group with his own phrase to complete, or a single word to use in a sentence. In these cases, each child had a worksheet especially prepared ahead of time for him.

Answering Questions. Written work for the rural class frequently reviewed whole class lessons. For example, work with color names was reviewed by directing students to "Make 3 blue swings." or (of a specific display) "Is it red?"

In the suburban class, in the fall, students were sometimes to write words they knew. They most often chose words from the correspondence program but a few wrote sentences using reading vocabulary words, e.g., "We are going to the store."

Crossword Puzzles. One written activity grew out of a game the observer played with Richard, our pre-school reader the first year. She prepared a simple crossword puzzle for him and soon he asked for another to do. After several of these, he prepared one for her. This went on for some time and made us think that his reading group might be ready to profit from the activity. The observer prepared and dittoed several crossword puzzles which were first presented and completed by the whole group with the teacher, and later done individually. The top and middle reading groups each completed several of these.

During the second year, some of the same puzzles were used, and several were made up to be used as part of the correspondence worksheets and reading comprehension exercises.

SRA lab. The SRA lab la, a primary level reading lab, was provided for independent work. This lab had short selections printed on heavy paper accompanied by comprehension questions. Seven levels of reading, varying in difficulty from grades 1 to 3, are included in the lab. Each level has approximately 20 selections and each is color coded.

Early in the fall of the first year we showed Richard, who could already read, how to work through the SRA materials by himself. Gradually, we introduced the materials to other children. The procedure was for the observer to work with each child for the first two or three selections including the questions. After that, the child was free to continue at his own pace. When he had finished reading and writing his answers, he brought them to the observer who corrected his work. Any paper with errors was given back to be corrected before the next selection was read. This imposed somewhat closer control than the SRA manual indicates. Children are supposed to read a selection, answer questions, correct their own answers from a key, and go on to the next selection. We felt that most of our first graders didn't have the skills to benefit from such complete independence yet.

By January, all students in the top group were using the SRA lab. In February and March the middle group began, and toward the end of April four of the five slowest readers were introduced to the lab.

Interest in this task was sporadic. Usually, during the first week a student would do as many as 10 or 15 in a set. Some weeks went by without a particular child doing any, but eventually another spurt of interest occurred. And, of course, two or three children never did become interested at all. The levels themselves are unequal in quality and the second and third levels have ambiguous questions. Children's production slowed down when they reached these levels and one or two who could handle harder material were allowed to skip to the next higher set. By the end of May, children were reading anywhere from Level I to Level V.

During the second year, only a few of the boys in the top reading group in the suburban school were introduced to the SRA lab. In the rural class, one girl in the top reading group began to work with the SRA selections in the late spring. Of all the children, this little girl seemed to enjoy and profit most from the extra independence this special assignment gave her.

Written Communication

We had hoped to allow the children to engage in many types of communication activities. Because of poor handwriting skills, these activities had to be curtailed until we could think of alternatives. One, the electric typewriter, we have already discussed. The other way we found the first year was to introduce a message board.

Message Board. By January of the first year, most of the children could write at a reasonable speed, with small enough print and acceptable legibility. We decided to initiate at least one writing procedure where written communication could take place from student to student, so we set up a "message board" in the back of the room. At first the teacher primed the pump. She reminded the class of birthdays, wrote that a reading group would get a new book that day, or asked who was the tallest boy in the class; soon individual children began to respond in kind. On January 24th, she wrote "Do you like all this snow?" which got lots of signed "Yes, I do -- No, I don't." responses. When she wrote "Who will have the neatest paper today?", Dan responded, "I'll try."

Although the teacher continued to write one-liners, the children began to use the message board on their own. Linda let everyone know about her special day with, "I am seven today." Joni inquired of the others, "Do you like your part in the play?" Once or twice after-school dates were made: "Jana - can you come to my house?" "I'll kall you - Jana." They wrote to ask the teacher what was going to happen in school that day, or ask her if she had had a nice vacation. Results of individual work at the typewriter were occasionally displayed on the message board including several original "poems." Letters received from children out sick, or from other classes were displayed as well.

This was a useful motivating device for several months, and highly motivating for some children. The response continued to be good from a few for an even longer period. The message board should either be considered a short term device, or more variations introduced to keep the children interested. We used many of the ideas that resulted from introducing the message board the second year, but made the task for children still easier by providing them with letters to arrange.

The Magnetic Board. "Instructo" magnetic letters and board were used in both PL classes the second year. Their purpose was to provide another medium in which the children could use their language skills. They were popular materials for the first month in the suburban class but after that the children were able to compose some sentences and the magnetic board did not lend itself to this purpose. In the rural classroom, the children used the magnetic board throughout the school year, perhaps because they were moving at a slower pace and the materials were suited to making small words or citing the alphabet. Perhaps too, the activity was novel to the rural children, and "old hat" to the suburban class. Playskool Toy Company markets a magnetic board and letters for approximately $4.00. It is not unlikely that many of the suburban children owned one at home. (Several of our friends use such letters on their refrigerators for their 3 year olds to play with.)

The magnetic board had limited use for independent work after the first few months of school. Occasionally, the observer would use a question as a stimulus for the board, such as, "How are you" or "What is your name?" or even "Make a sentence." On January 26, at the rural school, the magnetic board read, "Make a word with -ide." "Make a word with -ig." On January 30, was the question, "What color is grass?" "What color is Bobbie wearing?"

A number of the rural children would use the magnetic board to answer questions placed elsewhere in the room. Under a temperature chart were comments such as "Is it colder today than it was yesterday?" Children usually chose to answer on the magnetic board.

Feltboard. The second year, we purchased two feltboards and four sets of letters from the Novo Educational Toy & Equipment Corp. at $11.00 each. The board was covered with green flannel and was 36" x 48". An assortment of 3 inch capital letters and manuscript lower case letters were also purchased ($3.00 each set). These felt letters adhered to the flannel board's nap surface. The letters were big and brightly colored (in red for the capitals and yellow for the lower case letters). They contrasted well with the green felt board and were easily recognized from all over the classroom.

Children used the feltboard in their free time. Sentences such as, "This is September," were displayed on the board, and the children took turns finding and matching felt letters to the letters on the board. In the suburban school sentences from correspondence lessons were frequently used. For example Sam is sad.

Dad is sad., appeared on the board. Sometimes children would use the sentences on the feltboard as a model for typing. The teachers also used the feltboard to relay messages to the children. To introduce the new month, the suburban teacher wrote, "Today is the last day of November. Tomorrow is December." Birthdays were also announced on the feltboard, e.g., "Today is Jean's birthday. How old is she?" The board was frequently used as a motivational device. In the suburban class a unit on the farm was started in January. On the felt board was printed, "We will be learning about farms in the old days and farms today."

Children would wander over to the feltboard during their free time and arrange the letters to spell words, write simple sentences, or copy words from around the room. Interest in the feltboard tended to rise and fall. The children in the rural school spent more time at the feltboard and retained an interest in it for longer than the children in the suburban school. Throughout the year in the rural school you could see a child or two working at the feltboard; sometimes simply "playing around" with word families such as cat, mat, bat, etc., printing their names, or sorting out the letters and putting them into alphabetical order.

Reading

At no time were there less than 30 trade books and several primer and First Grade basal readers along the back window ledges for the children to read. They were borrowed from the school library, the central school system curriculum library, or provided by us. These were changed throughout the year. (In Appendix F-2 is a complete bibliography of books purchased for the first grades including comments by the observers on their usefulness.) In the suburbal class one hour a week was set aside as a library period, as well.

Several opportunities had been provided for children to read in pairs. Two girls from Group I in the suburban class frequently used free time to read to each other from the Chandler booklets during the fall term; others in the class occasionally chose this as a free activity. It was not until the second term that we observed children reading to each other in the rural class.

In late spring, to promote silent reading speed, three stop watches were brought into the suburban classroom. The children were accustomed to seeing them used by the observer at other times. Pairs of children timed each other's reading of short selections without adult supervision. This proved highly motivating, especially to the boys in the room. The purpose of these exercises was to force the children to really read silently at a rate at which they weren't mouthing the words. It also made the children more aware that speed is a factor in reading. Not all children could read silently at the end of the year but all of the top group and some of the second group seemed to be reading silently.

Spot Check. To see how children were spending their free time in the classroom, occasional spot checks were taken. One representative record from each classroom is given below.

A spot check on children's activities one morning in the suburban class found the following: Reading Group Two (7 students) were reading with the teacher; a little girl was at the typewriter and four students were watching her and "kibitzing;" 2 were at the magnetic alphabet board, one was using the slot chart, one was drawing a picture, 5 were finishing worksheets, 2 boys were visiting at their desks, and one was wandering.

A spot check in the rural school during the noontime lunch break in May found the following: 10 children reading self-chosen books, one at the typewriter, one looking through pictures in the Bennett Cert Animal Riddles book, one playing with toy trucks. The teacher's note concludes, "I didn't say anything! They just chose! I'm very pleased and impressed--this has never happened before this year and it is so gratifying."

Preference Test

The Task

As a way of scaling first grade lessons according to the children's own preferences, we prepared an instrument which allowed the students to choose which of several classroom activities they preferred. We gave this preference test to students in six first grades including the two PL classes. There were 87 non-PL children and 40 PL children who participated. All children were given sheets containing pictures of typical classroom activities. (Extra pictures were used with the PL classes depicting the special activities provided there.) Next to each picture was a set of three boxes, one containing a smiling face, one a sad face, and one a straight face. An examiner who was not the regular teacher read a sentence describing the activity involved in each picture, and then asked the children to mark the face that showed how much they liked the activity. Two pictures having nothing to do with school work were used first as practice. Activities with and without the teacher were illustrated. The pictures and the examiner's script are given in Appendix F-3 . The activities we chose are as follows:

All Classes

With teacher

1. teacher reads story
2. handwriting lesson
3. reading group
4. phonics lesson
5. arithmetic lesson
6. social studies discussion (of a farm)

Without teacher

1. painting or drawing
2. handwriting paper
3. reading independently
4. phonics paper

PL Classes Only

1. read-along
2. slot-chart sentences
3. printing
4. typing
5. listening to taped stories
6. telling story into tape

7a. (suburban) timed reading

7b. (rural) reading in pairs

Both in the With teacher category and the Without teacher category, the first activity listed above was included because we figured most children would say they liked it. Response to "teacher reads a story" and "painting or drawing" would give us some idea of how to judge the strength of the other responses. One pictured activity, given only to the PL classes and listed above as 7a. and 7b., was designed so that it could depict one child timing another's reading rate (suburban) or two children reading together (rural), since the timed reading was introduced only to the suburban children.

Results: All Classes Activities

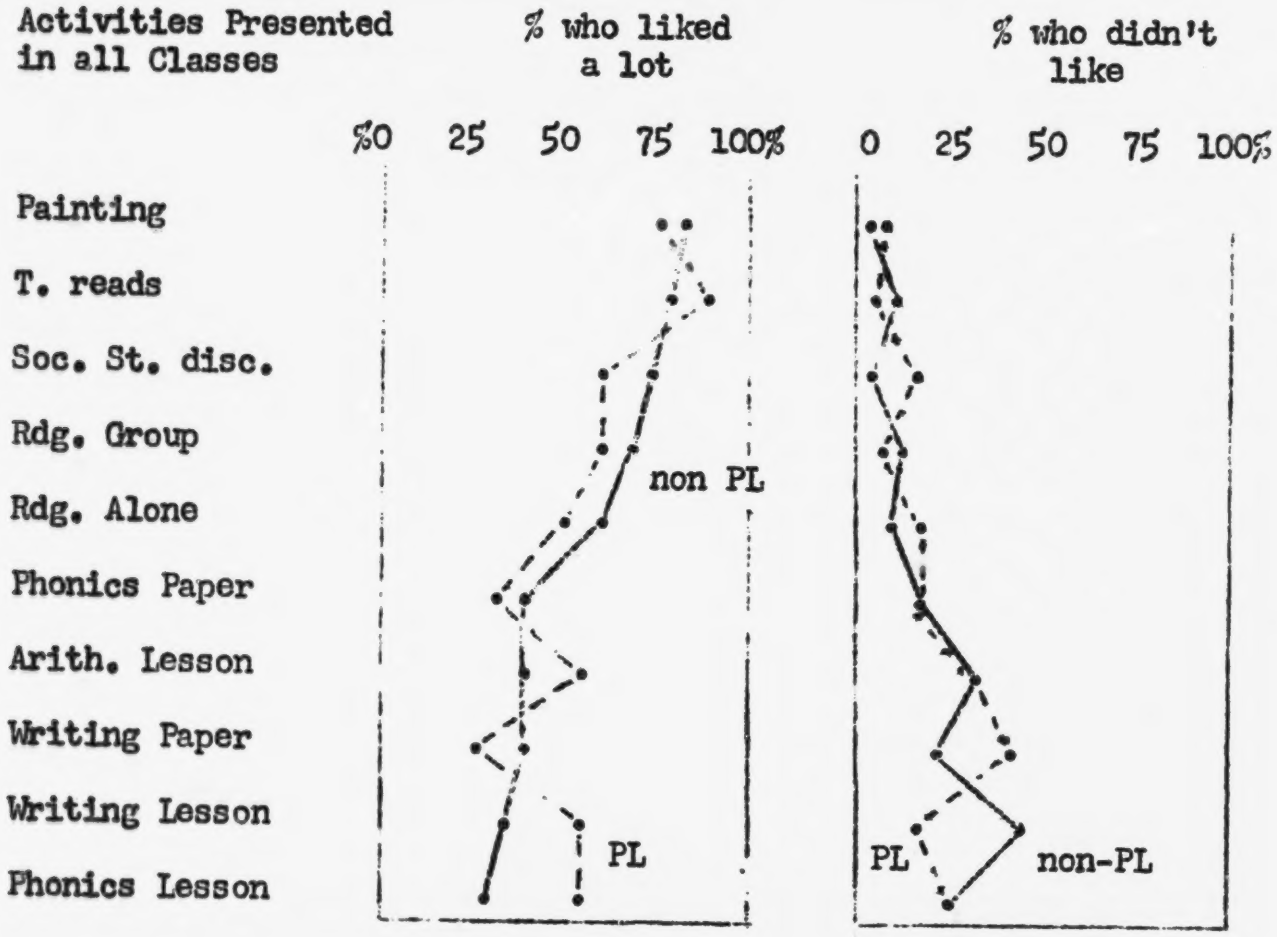
About 58% of the regular classroom activities were marked "liked a lot" by both PL and non-PL classes. The percentages differ, however, when separated into With or Without Teacher types of activities. The PL classes, on the average, marked 62% of the activities without the teacher as those they "liked a lot," whereas the non-PL classes preferred 56% of the activities of this sort. These percentages allow us to suggest tentatively (from among the possible explanations) that there may be somewhat more liking for independence among our PL children.

Similarly, the overall percentage of activities that children checked "didn't like" was the same for PL and non-PL groups: around 19%. In this case, percentages remained the same for the PL children for the With and Without Teacher categories (19.37% for With; 18.75% for Without), but the non-PL children disliked activities without the teacher more frequently (16% for With; 20.58% for Without), again--a slight suggestion of less independence.

Figure XII gives the percentage of each "All Classes" activity "liked a lot" or "not liked" among the PL and non-PL children.

Figure XII

Liked and Disliked Activities: PL and non-PL Classes

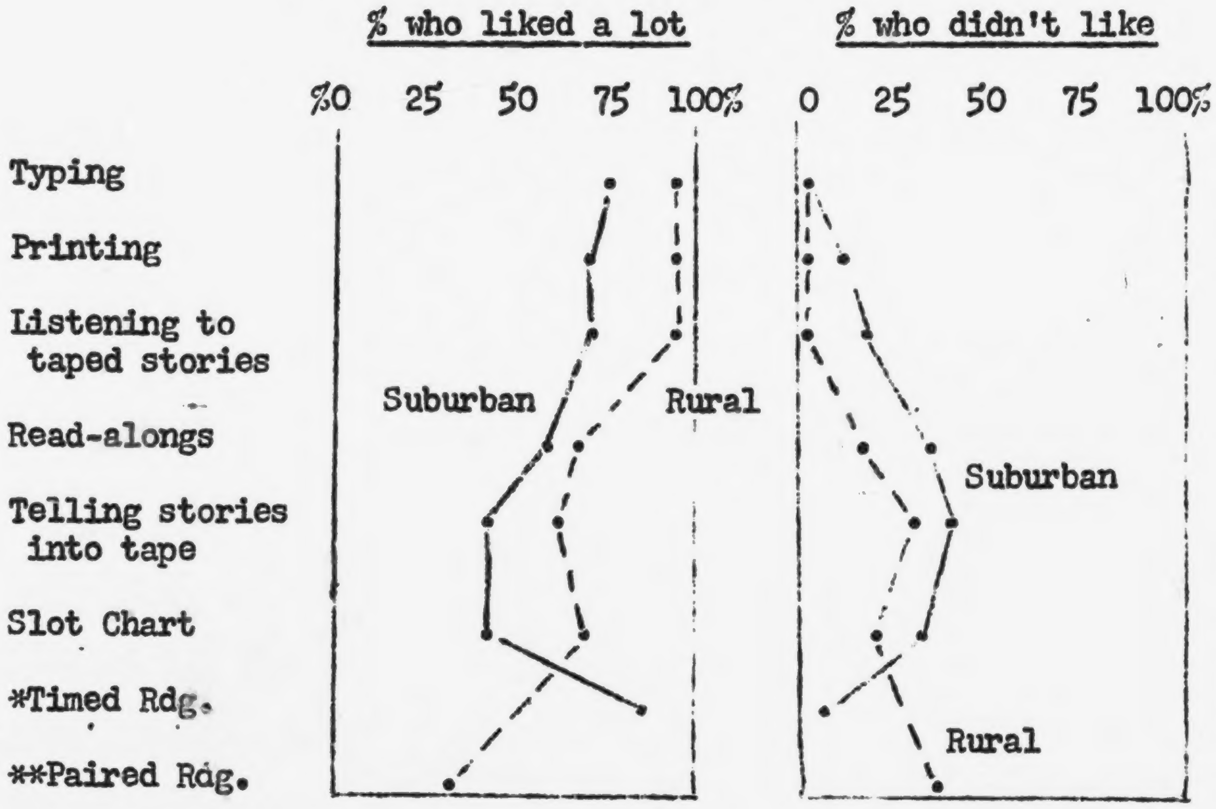


The Figure shows that the two group's percentage of choices of liked and disliked activities were close. The only sizeable difference seems to be in choice of writing lessons and phonics lessons. Both were chosen by over 50% of the PL children as a "like a lot" activity; only 32% of the non-PL children liked phonics and 40% of them liked writing lessons. Fewer PL children disliked handwriting lessons than non-PL children, but more disliked the writing practice papers. The PL handwriting program, which included such motivating devices as the magic slates, may have made lessons less onerous for the PL children. Handwriting practice during second semester, particularly in the suburban class, had advanced beyond the program we prepared and consisted of copying poems and sentences off the chalkboard. A large minority of the PL children were clearly disenchanted with this practice.

The PL children's choice of favorite special activities are charted in Figure XIII. The Figure separates the choices of each of the two classes. Both PL groups liked typing, printing, and listening to taped stories the best. In the rural class, no child disliked these activities, and in the suburban, the percentage of

Figure XIII

Liked and Disliked PL Activities



"dislikes" was very low.

Rural. The least "liked" and most "disliked" activity in the rural class was the paired reading. Very few of the rural children were ready to read independently with enough facility to enjoy this voluntary activity. Quite a few had never participated in it. Only seven children (out of 20) had checked "like a lot" for reading in pairs. Of the seven, all but one had some independent reading skills.

Suburban. In the suburban class, the slot chart reading and telling a story into the tape recorder were high on the "like" list for slightly less than 50% of the children, while 25% - 30% did not like these activities very much. It is surprising that so many children liked the slot-chart sentences at all, since slot chart reading hadn't been used in this classroom for many months. As for the taped stories, they were probably viewed as much harder work requiring more time, trouble, and organization than many of the other activities; that is, more work and less fun than some of the other possible choices available during free time. At any rate, 30% of the suburban class (6 children), among whom were some really good story-tellers, decided they didn't particularly enjoy this activity.

In the suburban class, 60% liked read-alongs a lot, but a large number (25%) didn't. This latter group may have reached the point in their reading where they wanted to read independently. The read-along technique, after all, was meant to be discarded when out-grown, anyway. The other four activities, including reading timed by a stop watch, were ranked high by 70% to 75% of these children.

Comparisons. Although Figure XIII shows how much more enthusiastic the rural children were than the suburban about many of the special activities, all PL children were more positive about the special activities than about the regular classroom activities. Compare the percentages below.

Table 30

Choices of PL Children (in %) by Type of Activity

Kind of Activity	PL Group	Liked a Lot	Didn't Like
All classes activities	suburban	55.5	18.5
	rural	62.0	19.5
Special Activities	suburban	62.1	14.0
	rural	70.7	14.0

The make-up of the test sheet may have been an influence. Although each choice was supposed to be made independently, the fact that the PL children saw on the same page a picture of an activity such as a handwriting paper, and another such as listening to a taped story, may have caused the former to be judged as just "O.K." in comparison with the somewhat more glamorous PL activities. Certainly, most children in the PL classes made choices indicating that they enjoyed these special activities more than the usual classroom ones.

Summary

The tape recorder, the electric typewriter, and the numerous other activities, all contributed to our attempt to create a literate environment. But these are things, inanimate, and by themselves mean nothing. A literate environment requires two components. First, a way must be found to provide a number of opportunitites to read, write, and listen that seem sensible and enjoyable to the child himself. Second, the teacher's role is of paramount importance. No matter how many inventive and stimulating activities a classroom has, if the teacher rigidly controls their use, or uses them as a form of punishment or reward, the value is lost. The teacher must consider the literate environment as part of her classroom atmosphere, and provide free time regularly so that children can explore a variety of language materials. Above all, the teacher should remember that it is not just the materials but the whole atmosphere that counts. And it is she who creates the atmosphere.

Chapter VII

Observer in the Classroom

The observer had a number of functions. Some of these had been planned; some evolved; and some were added during the year.

As originally conceived, the observer's task was to gather data on the children's progress and their response to the curriculum. With the introduction of the tape recorder, typewriter, and printing press, it was necessary to supervise and participate as well. At the teacher's request, the observer also acted as a feedback person, exchanging ideas and providing information based on actual records.

In order to place these functions in context, we will first describe the relationship of the observer to the teacher, and then to the children.

Relationship with the Teacher

The observer teacher relationship changed in the course of the year. From the beginning, the observers tried to make informative suggestions and comments. For example, the observer might have noticed an increased accuracy or fluency in a child's reading, or, conversely, recent signs of psychological stress on a child's part. Information of this sort was always made available to the teacher, and helped her assess group or individual trends she might not have noticed because she had been absorbed in the actual teaching.

Since one of the observer's jobs was to record responses in the reading lessons, she began to make suggestions based on these records; for example, she might suggest that the teacher could easily leave out the review part of the next day's phonics lesson; that a certain ditto contained ambiguous instructions; or that it would be well to spend another day on a particular point.

Finally, the relationship progressed to the point where the teacher and observer were consulting before any major decision was made for change in the classroom. This cooperation may well have begun as politeness but certainly continued out of mutual respect.

In the classroom, the observer always remained as unobtrusive as possible. When observing lessons, she sat behind the children but close enough to hear. During these observations she refused to give attention to any of the children in the room. Very soon it became clear that she was not to be disturbed at this time. In addition, the teacher almost never spoke to the observer while teaching. Thus, the observer was careful never to participate in the actual lessons.

In all cases the teacher made the final decision. When scheduling any testing, or work with extra activities, the observer checked with the teacher before class started. She also checked before borrowing materials or samples of work. This allowed the teacher complete freedom to veto any activity that might interfere with her own plans. In cases where there was any doubt, the decision was made in the light of preserving the teacher's authority in the classroom.

Relationship with the Children

On the first day of school, the observer was introduced to the children and then was almost totally ignored for a few weeks. During this time she tested and observed individual children. Most likely, if the first graders thought about it at all, they probably tagged this visitor as a "question asker" and "silent watcher."

Soon, the teacher introduced and demonstrated the use of the special activities, which one by one, were taken over by the observer. When this happened, the children realized they had another potential source of attention and help, and they began to look to the observer for assistance and guidance both in their written work and in the extra activities. Nevertheless, both the observer and children always looked to the teacher as their final authority.

In the suburban class the observer gradually began to manage and control all the extra activities. In the rural class, possibly because of the different personalities involved, the teacher continued to be directly involved in all activities at all times, and the observer served to guide individual children. This difference is an irrelevant one in terms of success of the program. It merely shows that division of autonomy in a classroom can be solved in many ways.

In supervising the special activities, the observers chose the children who would take part each day, and made sure every child had "equal opportunities." If a child did not wish to take his turn, he could refuse. (This happened only once. One suburban child, for reasons known only to himself, refused to type for the first two weeks.)

As well as supervising the special activities and conducting the individual testing, much of the time not spent observing was given over to such tasks as answering questions about the worksheets or spelling words for the children, especially in the suburban class.

Finally, time was spent with the children who had finished their written work, directing them towards the various free time activities in the room, such as reading library books, doing puzzles, drawing pictures, and so forth.

All these duties allowed direct contact with individual children on a daily basis, and, as a result, each observer began to build warm relationships with many of the first graders as the year went on.

Activities with the Children

The observer was responsible for maintaining the machinery and the materials in the activities part of the room. The tape recorder, typewriter, and printing press were in close proximity to each other so that the observer could keep an eye on more than one activity at a time. All materials used by the observer were stored on shelves near these machines. In the suburban class, the tape recorder and typewriter were not often used simultaneously, since it was not a very large room and the noise level would be too high to allow teaching to go on.

Taped Stories

Thirty-six stories were taped by various speakers, many by the observers, themselves. The observer kept records of which children had listened to which story, and in time became adept at calling on children as they were finishing their written work. These on-the-spot decisions were more successful than any pre-set scheduling we could work out. Uusually, all children in the class could hear a story in one week.

Before the tape recorder was turned on, the observer pointed to the cover, named the story, and then asked the children to look through the book and get some idea of the story from the pictures.

After the tape was turned on, the observer stayed with the children, and sometimes even listened with them to see that they were able to turn the pages when they heard the click on the tape. In the rural class, children needed help with turning pages well into the spring semester. Later in the year, it was not necessary to go through all these steps, but the observer often asked a few questions after the listening period to see if the children had understood the story.

Throughout the year, children continued to enjoy listening. Often, a child would listen to the same story again immediately after hearing it. With the observer's help, students soon became adept at helping each other turn the page at the proper time. In the suburban school, the observer guided the children until they were able to set up, start, and stop the recorder, but the observer herself always re-wound the tape. At this point, the suburban teacher began to teach and also supervise the tapes once in awhile without the observer's help.

When the tapes were used to try out special listening activities, the observers were directly responsible for observing and recording the results. One such occasion was the tape of Hop on Pop in which the children were supposed to point to each word in the book as they heard it being read. Another instance involved tapes of the instructional stories. When these tapes were introduced, the observer had to make sure she also observed the same children in the reading group later to see if prior listening had influenced frequency of errors in oral reading. Besides taking data on such occasions, the observers were expected to note reactions and attitudes, and make subjective judgments about the worth of the activity.

When we tried taping the children's own story-telling, the observer not only made up the stimulus materials (picture book with text covered, or pictures mounted on construction paper) but also prepared each child to tell his story and acted as the first audience for the story. Later, the observer transcribed the story and ran off enough copies for the whole class, plus samples for our files. Since a number of different follow-up activities were possible, the observer and teacher usually decided which one would be used depending on the individual child and the quality of the story itself.

Sometimes, when children read for the tape recorder, the observer and child would listen immediately and discuss the quality of the reading. The success of these sessions depended a great deal on the delicacy of the observer's comments and questions, and the fact that each observer knew each child very well. Thus, the comments had to be specifically tailored both to the quality of the reading and the personality of the child. In most instances, the observers became experienced at getting the child himself to make some decisions about what qualities good oral reading should have, and what level his oral reading was on. In every session of this sort, the observer stressed the positive aspects of the child's own performance.

Typewriter

The observer listed on the chalkboard each day the names of children who could use the typewriter. It took about two weeks for each child to have one turn. About three children each day took turns, and the observer kept a carbon of the productions.

The typewriter was introduced as an instrument to work with and not a toy. With this in mind, during the first few sessions, the observer worked individually with the children and encouraged them to spend time experimenting, finding certain keys, and do simple matching tasks.

Later, the observer decided which of the prepared dittoes were suitable for individual children, or sometimes helped them to modify their own ideas for a typing task. After November, in the suburban school, most children could work alone with only occasional help. The observer in the rural school found that assigning a "helper" to a slower learning child was a profitable learning experience for both children involved.

Even though work at the typewriter could soon go on without much direct guidance, the observer was always available when needed. An attempt had been made to have the choice of tasks rather than a rigidly structured program, and, given this system, the observer was invaluable because she could give on-the-spot suggestions.

Printing Press

Since the type fonts were a mirror image of real print, the observers made out labels on which the letters were printed conventionally. These labels were then pasted over each letter slot where the fonts were kept. The observer encouraged the children to look at the labels when searching for a particular letter rather than examining the fonts, themselves.

With the guidance of the observer, the children learned to clean and care for the press by themselves. The observer, however, was responsible for returning the type fonts to the correct slots after they had been washed and dried. Sometimes she suggested reasons for sending messages, or even people to whom a message could be sent, and then wrote out the message the child dictated as a model for him to copy. The observer stayed with the children long enough to see that they started at the correct side of the type holder and were setting the type in the right direction. After the children set the type, she again checked for errors and reversals, time permitting.

By late spring, the observer in the suburban school felt free to allow several children to use the press completely independently.

Scheduling the Observer's Time

Observers were in the classroom all morning from Monday through Thursday each week. In the rural school, each morning session lasted three and one-fourth hours, and in the suburban school, two and one-half. A typical week (ten hours) in the suburban school in the spring term might be as follows:

1. Observing reading groups (after Christmas one observation was taken of each of the four groups each week) Total = 80 minutes
2. Observation of each of three correspondence groups each week. Total = 60 minutes
3. Observation of teacher's description of worksheets to whole class (possible attention or interaction data) Total =40 minutes
4. Tape recorder; setting up and supervising--twice a week Total = 40 minutes
5. Printing press; assistance to children: three children twice a week. Total = 50 minutes
6. Helping individual children (spelling words, worksheet, answering questions, etc.) Total = 60 minutes
7. Correcting worksheets Total =100 minutes

This schedule was quite flexible. Early in the year, more time was devoted to individual testing. Later, at intervals, other informal tests were given by the observers. For the first two months, class and individual attention data was recorded, and interaction between teacher and students in whole class lessons. In the rural school, there was usually a whole class lesson for the first half hour in the morning, and it was observed and data recorded about twice a week throughout the year. Also in the rural class, because the children seemed to need and want more individual encouragement and attention, the observer spent far more time helping with individual problems and answering questions. Therefore, the list above can serve only as a general guide as to how the observers spent their time.

Activities Involving Collection of Material for the Project

Observation of Lessons

The observers were concerned with recording two types of behavior--attention and performance. (Development of procedure to record attention and performance is discussed in Chapter I.) Early in the school year attention records were kept on many of the whole group lessons. As soon as small groups were used for teaching (by the end of October), attention was easy to note on performance sheets, and systematic recording of attention was discontinued. Exceptional lack of attention by any child could still be noted by a brief remark placed directly on the performance sheet. Once in awhile, when there seemed to be a need, the observer was asked to record attention during a specific lesson, or at a specific time of day.

Performance was recorded throughout the year on various forms depending on the type of group (large or small), and material being used (teacher-composed sentences, home-made books, or regular texts). Oral reading was observed in each reading group at least once a week. After separate correspondence groups were formed, each of these was also observed once weekly until a specific group was observed to be making few if any errors for a number of lessons. At this point, the observation of correspondence lessons was discontinued. Errors dropped to almost zero in Reading Group I and II in the suburban school in late spring, and performance records were discontinued for these groups at that time. But in most cases for most of the year, two samples of the child's performance in small groups was available each week. The observer's main concern was recording the errors made by each child, the type of correction, and the time he took to read a passage.

One of the observer's responsibilities was to bring to the immediate attention of the teacher and PL staff any radical changes she had observed in attention or performance. Otherwise, these records were discussed routinely at the weekly after-school meetings.

A capsule summary information sheet of work covered was filled out each week by the observer and checked by the teacher. This form became known as the "pink sheet." A sample of a completed "pink sheet" can be found in Appendix G . It gave the same information usually found in a teacher's plan book. It contained:

1. The brief content of lessons for the whole morning (e.g., Reading--Group I, "Story Fun" pp. 56-72, plus review of vocabulary and slot chart drill).

2. More detailed comments on the lessons were placed on the back of the sheet. Class performance in general and individual performance was noted by both the teacher and observer. Extra activities and additions to the literate environment were indicated as well.

3. Reading group changes were listed.

4. Names of children using tapes and typewriter were listed.

5. Absentees were listed.

6. Any other interesting information especially about changes in class organization or behavior might appear occasionally.

The pink sheet summarized the week from one Wednesday to the next because teacher and PL staff met for an hour or so every Thursday afternoon. Frequently, the contents of the pink sheet became the starting point for discussion at these meetings.

Marking of Worksheets

In the Rural class, the teacher marked all worksheets. At the beginning of the year sheets were marked with a face ☹ ☺ according to the child's general performance. The children were very unhappy with the "sad" face. Later the children received a minus number according to how many items they had wrong, e.g., 5 wrong = -5.

In the suburban class, the observer marked all worksheets before noon on the day they were handed out. Frequently, she was able to mark papers before that particular reading group assembled. Teacher and students could then review the written work together if there were any problems. Performance in this class was indicated by the number wrong on the sheet being placed in a circle, or if all answers were correct, by marking the paper 100%.

Performance on many of the worksheets in each class was recorded by the observer onto a class list sheet. We began with a weekly summary of results of written work, with each different paper indicated by a short notation, e.g., Phonics #7, and the date. Later, it was found to be much more convenient to attach each ditto or sample of work to a class list which provided space for the number of errors for that ditto for each child. On some sheets it was useful for the observer to add the actual answers. The observers were encouraged to add any comments on the student's performance, or any suggestions for revision of the ditto if they thought this necessary. A loose-leaf notebook was kept with sample copies of all dittoes as well. These were filed by date, and by the group who used the ditto.

Collection of Samples

In addition to regular seatwork dittoes, many other samples of children's work were collected throughout the year. These included:

a. handwriting samples
b. all original stories
c. complete class samples of worksheets--often a ditto with comprehension questions had interesting answers and these were collected and xeroxed copies kept.
d. duplicate copies were collected of all typing and printing done by the children.

Special Projects

Throughout the year both observers had an excellent opportunity to help with problems individual children were having. For example, in the suburban school at least two children in Group I were reading much more slowly than others in the group. The observer gave these children speed reading practice over a two week period. In the Rural school, the observer gave students individual help with handwriting problems. These types of projects are discussed in more detail elsewhere in this report. Here it is sufficient to note that, a) the observer had the time and role position to carry out such projects and b) she was in an excellent position to detect the problem and help set up the required program to alleviate it.

Chapter XIII

Analysis of Oral Reading Errors and Strategies of Information Use

I

This chapter concerns qualitative changes in children's reading errors as they learn to read, and as a function of the difficulty of material they read. On the basis of the kinds of errors children make, we have made inferences about kinds of information used by children to identify written words.

Broadly speaking, the reader has two major sources of information available to him for identifying any particular written word in a text. One source is the information contained in the letters of the word. We will call this graphic information. The other source is the information the reader has about words on the basis of preceding words in the text, and his knowledge of semantic and syntactic constraints in the language. We will call this contextual information.

That graphic information is necessary for reading is self evident. However, a few words may be in order on the role of context in reading. It has long been known that experienced readers can read words in meaningful text much more rapidly than they can read the same words when not forming meaningful text. (Cattel, 1385; Tinker, 1958; Morton, 1964). Goodman (1965), has demonstrated that children make one third to one fifth as many errors when reading words in context as when reading the same words in lists. Without examining at this point the details of this phenomenon, it is clear that in some way, context facilitates the process of oral reading.

The present analysis is based on a method of analyzing reading errors developed by Dr. Rose-Marie Weber (1967). Using Dr. Weber's method, errors can be interpreted as indicating strategies for using graphic information, contextual information, or both types to identify words.

Reading errors are generally approximations of the correct response, rather than completely random. These "approximations" may be seen both in terms of graphic information and in terms of contextual information. We can examine errors for evidence of both kinds of approximation.

Use of contextual information is inferred if an error "fits" in a sentence grammatically and semantically in terms of the preceding context in that sentence. This suggests that the reader applied constraints based on contextual information to his response.* Examples of contextual fit are given in Appendix A.

The use of graphic information is inferred if the written form of the response approximates to some degree the written form of the stimulus word. Such approximation suggests that the reader's response was guided in part by graphic information in the stimulus word. (This guidance could either be in the form of applying spelling-to-sound rules to the letters in the stimulus word, or in confusing the stimulus word with another similar word the reader is experienced with.) Weber, 1967, reviews methods of describing the degree to which oral responses approximate written stimuli.

In this study, graphic approximation of error responses to stimuli, is assessed simply by noting whether the first letter of the response matches the first letter of the stimulus word. This may appear very crude. However, Weber, 1967, provides evidence that first letter correspondence is strongly associated with correspondence of other letters and sequences of letters.

An additional category of errors, non-responses (child stops upon encountering a presumably difficult word) was added to Weber's categories. Non-response errors are also thought to indicate attention to the graphic information in words, on the assumption that the child could not realize that he does not know a word unless he looks at it with some care.

A single error cannot provide sufficient evidence to draw conclusions about a child's strategies for identifying words. In this study, proportions of all errors over specified periods of time indicating use of contextual information and graphic information are taken as rough evidence that the reader is frequently or infrequently making use of the strategy (or strategies) indicated. Perhaps of even more importance than the absolute proportions observed are the changes in proportions and relationships between changes in proportions. These presumably indicate the directions of changes in strategies of information use.

Using this modified version of Dr. Weber's method of analysis, I studied strategies as children in our two first grade classes learned to read. Contrary to my original expectations it was apparent by November 1966, that, early in the year, errors indicating use of context information were far more common than errors indicating use of graphic information. Furthermore, there appeared to be a trend for the more able readers to begin to make "non-response" errors. Upon encountering a word they didn't know or weren't sure of, they would simply stop until the teacher or another child told them what it was. When we had originally decided to observe this category of errors, I had anticipated that non-response errors would occur early in the year, and would indicate the least development of reading skill. The discovery that the more able readers were making this type of error in November, often after a period when they made mainly errors indicating a strategy using context information showed that this expectation was wrong.

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* A certain number of errors would show "contextual constraints" on a purely random basis. However, the incidence of contextually constrained errors is too high (70 + %) for this explanation alone.

As a result of these unexpected findings, I formulated a set of hypotheses about the development of reading skill. According to these hypotheses, the child passes through four periods marked by different strategies or combinations of strategies for identifying words when reading. The order of development is thought to stem from the child's initial attempts to use skills he has available upon entering first grade, and from his growing new skills in reading. The four periods are as follows:

First Phase. Child predominantly makes errors indicating use of contextual information.

The early use of contextual information probably reflects an attempt by the child to maximally utilize information he can gain aurally. The normal child comes to the first grade with great skill in dealing with oral language. He can easily discriminate and learn words, and he has largely mastered his language's grammar. On the other hand, most children bring little or no skill in dealing with the written form of the language. They cannot easily discriminate or store visually presented words. (Budoff and Quinlan, 1964.) Those who do have some acquaintance with the alphabet or some written words generally learn to read more rapidly than those who do not (Chall, 1967, Ch. 5). I therefore think it likely that many children will attempt to minimize the amount of graphic information they use in reading and maximize the amount of contextual information. Children can learn aurally the list of words that occur in their reading. By restricting their verbal responses to this list, they can greatly simplify the task of reading, especially early in the year when the list of words they have been exposed to in reading is small. When this constraint is combined with grammatical constraints, the child will be able to "identify" many words without using any graphic information. On the other hand, he will make a good many errors, and these errors, while contextually acceptable, will indicate little use of graphic information.

Second Phase. Child makes predominantly non-response errors.

I have come to think of the non-response error as evidence of the early development of emphasizing graphic information. The reader is attending to the individual word. He perceives it clearly enough to realize that he does not "know" the word. But he does not have sufficient skills in dealing with graphic information--i.e., sound-spelling correspondences--to work out the identity of the word on his own.

The child, in moving to this phase, now shows that he sees as one of the objects of reading the correct identification of individual words. He probably reaches this conclusion after frequently making errors under his former strategy. It is also probable that with increased experience in reading, his ability to perceive written words accurately improves, both through learning to attend to relevant features of letters, and perhaps through beginning to master some of the structural constraints in written English. These possibilities will be explored further in the discussion chapter. Clearly, these two hypothetical changes, in the goal of reading and in perceptual skill are not mutually exclusive.

Third Phase. Child makes errors showing predominant use of graphic information.

During this phase the child probably begins to be able to use spelling-to-sound correspondences, or the "phonic" structure of written English. Even if he does not begin to use phonics, he perceives words clearly enough to make mistakes which suggest confusion with very similar words. These might be thought of as a form of stimulus generalization.

This phase represents an increase in the child's skill at identifying written words. His skill presumably increases as a result of extracting sound-spelling correspondences and further improvements in his ability to perceive words accurately.

It can be seen why this phase must follow the preceding phase when non-response errors predominate. Before being able to extract sound-spelling correspondences, or seriously improve the accuracy of his perception of written words, the child must attend carefully to written words. I believe he does not begin to do this until the non-response period.

Fourth Phase. Child makes errors again showing the use of context. However, errors are no longer constrained by the list of words learned, but are more constrained graphically.

This phase is seen as an approximation to adult reading. The reader reduces the amount of graphic information he needs to identify an individual word by applying semantic and syntactic constraints based on what he has already read, and on his general knowledge of English grammar and the subject of the text.

This phase will develop as the reader becomes highly skilled at recognizing individual words. The purpose of reading now shifts from being primarily the accurate identification of words to an accurate understanding of the text. The reader concentrates less on individual words and more on "the story."

Finally, in describing these hypotheses about the development of reading skill, I suggested that if a reader in the third or fourth phases encountered a very difficult passage, we might expect to see a "regression" of strategies from the context-and-graphic information-oriented strategy of the fourth phase to the graphic information strategy of the third phase to the simpler non-response strategy of the second phase. I did not anticipate a shift from the second to the first phase when difficulty was encountered. (Indeed, logically, even children in the first context information-oriented phase would be expected to adopt a non-response strategy if the material they were given was sufficiently difficult or unfamiliar.) I expected these shifts in response to difficulty because on the grounds that less contextual information would be available on difficult passages, and that with less contextual information available, partial phonics information would be inadequate for word identification. Hence the child would be compelled to adopt non-response strategies.

II

Observations and Coding Data

Data used in this study was obtained in two steps. First, observations were made either in classroom reading sessions or from tape recordings of individual reading sessions. These observations were made by writing down on transcripts of the texts being read any deviations the child made from the text. The following phenomena were noted on the transcripts:

1. Non-responses (Child stops reading just before a word it is assumed he does not know. Indicated by a line between the last word read the the next word, and underlining the non-read word. Example: John/cried.)

2. Substitutions Child says something other than the word on the page. If he either continues, or stops having made a substitution, a substitution is recorded. Indicated by crossing out the misread word and writing over it the substitution.)

3. Insertions (Child adds a word while reading a sentence. Indicated by entering a caret (^) at point of insertion and

writing over it the inserted word.)

4. Omissions (Child skips a word in a sentence. Indicated by crossing out skipped word.)

These transcripts were then coded and summarized according to the following categories:

1. Number of words read.

2. Number of sentences read.

3. Number of self-corrections.

4. Number of errors not self-corrected.

5. Number of non-response errors.

6. Number of substitutions.
   a. Number of substitutions which are grammatically and semantically acceptable up to and including the error. (Previous errors, if any are taken into account rather than the original form of the sentence.)
   b. Number of substitutions in which the first letter of the response matches the first letter of the stimulus. This category is used as a rough index of graphic similarity.

7. Number of insertions.
   a. Number of insertions that are grammatically and semantically acceptable up to and including the error.

8. Number of omissions.
   a. Number of omissions that are semantically and grammatically acceptable up to and including the first word after omission.

For purposes of analysis in the present study, these categories were combined as follows:

1. Contextually acceptable substitution, insertion, and omission errors were summed as "context" errors. The proportion of these errors among all errors was taken as a measure of the child's use of context information in word recognition.

2. The proportion of "graphically similar" substitution errors to all errors was taken as a rough measure of the child's use of graphic information. Although the measure of graphic similarity used in this study, correspondence between the first letter of the response and the first letter of the stimulus is

crude compared to the complex measure of graphic similarity used by Weber, it is highly associated with the graphic similarity index. Dr. Weber made an analysis of her data showing that the mean graphic similarity of 376 substitution errors with the same first letters as the stimuli was 584.5, while the mean graphic similarity of 480 errors without the same first letters was 167.7.

3. The proportion of non-response errors to total errors was taken as another indication of use of graphic information, but with less skill.

4. The combined proportion of graphically similar substitutions and non-response errors was taken as an index of "graphic" errors.

Observer reliability has been obtained for taped observations. I retranscribed and coded a set of readings by one class of sixteen children that had already been transcribed and coded by the assistant who regularly did this job. The assistant noted 103 errors while I noted 98. (She was correct upon re-checking the tapes. This is not too surprising, considering her considerably greater experience.) We were in perfect agreement on coding all errors noted by both of us except for the category acceptable substitutions. The regular assistant coded 24 out of 30 substitutions acceptable while I coded 27 out of 30 acceptable. There was no disagreement on those coded unacceptable by both.

Perhaps the most important aspect of the reliability of the transcribing and coding of these observations is that all children would have been categorized identically under definitions used for the analyses in the next chapter as a result of either transcriber's and coder's work.

III

Assessing Ability at the End of the Year

Data obtained in individual taped sessions at the end of the year served three functions. First, I used data from these sessions to determine each child's relative reading ability at the end of the year, a variable which is then related to the child's development through the year. Second, data from these sessions provided an opportunity to examine the relationship between error rates and strategies of information use. Third, since children from four classes other than those studied throughout the year were taped, results of the taping provided an opportunity to compare reading strategies used to see if these children were generally similar to those studied throughout the year (see Chapter III). This similarity would provide little proof of the generality of my findings. However, if the other classes were not similar, considerable doubt would be cast on the generality of the findings presented in this thesis.

In order to obtain data on ability and performance under varying degrees of difficulty, four passages of graded difficulty were prepared. The easiest passage used vocabulary common to both pre-primers. The next passaged used 80% vocabulary from the pre-primers. The remaining passages had 59% and 34% pre-primer vocabulary. Words not from pre-primers may have occurred later in the PL or non-PL programs. Our observations suggested that after the pre-primer level, children seemed able to read some unfamiliar words without help. Thus vocabulary restrictions become less meaningful for more advanced readers. Furthermore, it was not possible to determine the complete list of words used in the PL series due to the use of books for which vocabulary lists were not available. At any rate, the procedure used to produce the test passages yielded results in the expected order of difficulty. No significant differences in the proportions of children able to read each passage appeared between PL versus non-PL classes.

Sampling. All children in the PL classes were tested.* Half the children in each reading group in other classes were randomly chosen.

Administration. Each child read the first passage. If he made no more than 12% errors, he read the second passage. The same criterion was used to determine whether a child would read the third and fourth passages. This was done to avoid forcing a child to read when the material was very difficult for him.

If a child experienced considerable difficulty in reading a passage, he would be stopped. "Considerable difficulty" was determined by missing an average of one word in four.

Obtaining ability ranks. The following procedure was used to rank children by oral reading ability. The children read passages starting with the easiest. Children were then ranked according to their error rates on the most difficult passage they could read.** Thus, a child who made 15% errors on the fourth (most difficult) passage ranked higher than a child who made 5% errors on the third passage but could not read the fourth. The latter child in turn ranked higher than one who made 15% errors on the third passage. The reliability of this technique can be estimated by the correlation between performance on this set of passages and performance on another, similar, set of passages read by children in the two Project Literacy classes. The rank correlation, over 33 children, was .95. The validity of the technique can be seen in a rho of .89 between these oral reading performance ranks and scores on the standard Metropolitan reading comprehension test. I consider my oral reading test to be more reliable than the Metropolitan test (a multiple choice test), and more valid in that there were a number of children at the ceiling and floor of the Metropolitan test.

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* Two Project Literacy children were dropped from the sample because they entered first grade reading well.

** Nine children were unable to read even the easiest passage. They were ranked on the basis of performance on another, easier taping. This latter taping was not used for all ranking because it was not used with non-PL classes.

IV

Identification of Phases

In order to examine the hypotheses about strategy changes over the year, I first identified the phase during which each child made predominantly non-response errors, and then compared other indices during the pre-NR, NR, and post-NR phases. (Examination of the differentiation of the post-NR phase into the two hypothesized phases is carried out in the section on changes within phases over time.) In order to identify the NR phase, I pooled observations on each child by months. (This was necessary to obtain sufficient numbers of observations to judge the distribution of error types.) I then applied the following criteria to determine the months during which the child's NR phase occurred:

1. The first month during which 50% or more of the child's errors were non-responses was located. This was taken as the beginning of the NR phase.

2. The end of an NR phase was defined by the two consecutive months in which less than 50% of the child's errors were non-response; except for the last month (May). Here, less than 50% non-response errors for the single month was accepted as evidence of the end of the phase.

3. Despite pooling errors by months, there were still some children who made zero, one, or two errors in a particular month. (See Appendix two). I based decisions about a child's status with respect to non-responses in these months on the following rules:

   a. When zero errors were made, I assumed that the child was in the same phase as the previous month.

   b. When one error was made, it could either be a non-response error or a response error (including here omissions). I assumed that the child's status was the same as in either adjacent month agreeing with the single error month. If neither adjacent month agreed, I assumed the child's status was the same as in the two adjacent months which then agreed with each other.

c. When two errors were made, if they were either both non-responses or both responses I took them as an accurate estimate of the child's status. If one error was a non-response, I treated the month as I would a month with a single error that was a non-response. Thus, if 50% or more of the errors in at least one adjacent month were non-responses, I considered the month in question to be an NR month. Otherwise, I considered it not to be an NR month.

V

Distribution of Children in Phases by Month

The results of this analysis yielded the following pattern of pre-NR, NR, and post-NR phases. In October, 16 children were making predominantly non-response errors. The remaining 26 children were making predominantly response errors (including omissions) in October. Table 31 shows changes in the distribution of children in the pre-NR, NR, and post-NR phases over the year.

Table 31

Number of Children in Pre-Non-Response,
Non-Response, and Post-Non-Response Phases by Month

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Pre-NR	26	22	16	13	10	7	3	3
NR	16	17	19	21	19	14	14	7
Post-NR	0	3	7	8	13	21	25	32

Overall, 26 percent of the errors made by children in the pre-NR phase were non-response errors; 66 percent of errors made in the NR phase were non-responses; and 35 percent of the errors in the post-NR phase were non-responses.

The original hypothesis was that children would pass through a response phase before entering the non-response phase. We see here that as early as October, 16 children were in an NR phase. There are several possible explanations for this. First, that the hypothesis was partially wrong--that some children begin reading with an emphasis on graphic information. Second, that children who by October were already adapting a graphic information emphasis had earlier started with a response strategy emphasizing contextual information, and had shifted strategies by the time we started making observations. (The earliest usable observations were made on October 13th. School started about a month earlier.) Third, that some children begin with or shift early to a graphic-information strategy and then go to a contextual-information strategy without mastering graphic information skills, presumably because context information seems easier or more effective.

These hypotheses are not mutually exclusive. We shall see some additional evidence for the first (that these children are using graphic information) and the third (that some children make an early effort to use graphic information and then shift to using contextual information in a primitive fashion). No data is available on the hypothesis that these children might have used contextual information earlier.

VI

Strategies of Information Use in the Different Phases

Table 32shows percentages of errors indicating use of graphic and contextual information in the three phases defined by the occurrence of non-response errors. Recall that it is possible for some errors to provide evidence of use of both contextual and graphic information. Hence it is possible for the percentages to add to more than 100.

Table 32

Percentages of Errors Indicating Use of Contextual and Graphic Information by Phase

	Phase		
	Pre-NR	NR	Post-NR
% Contextual Errors	55	24	54
% Graphic Errors	40	79	64
% Non-responses	26	66	35
% Graphic Sub.	14	13	29
Number of Errors	391	770	787
Number of Children			

In this table we see that the percentage of contextual errors is over 50% of all errors both before and after the NR phase. This percentage falls to about 24 percent of all errors during the NR phase. This occurred despite the fact that the incidence of total errors is lower in the NR phase than in the pre-NR phase. Thus it is clear that there is a shift in strategy rather than the addition of a new form of errors.

Errors indicating the use of graphic information follow the expected patterns fairly well. Graphic information is used least in the pre-NR phase. Note in particular that the percentage of *graphic substitutions*, thought to indicate skilled use of graphic information, is quite small in the pre-NR phase. The use of graphic information is highest in the NR phase. This is, of course, in large part due to the high rate of non-response errors which are used to define this phase. However, the percentage of graphic substitutions does not decline in this phase, unlike the percentage of contextual errors. A much greater percentage of *response* errors (i.e., errors that are *not* non-response errors) are graphic substitutions in the NR phase than in the pre-NR phase (38 versus 19 percent). The percentage of contextual errors among *response* errors shows little change in the two phases (75 percent in the pre-NR phase, 71 percent in the NR phase).

In the post-NR phase, the use of graphic information is considerably greater than in the pre-NR phase, although not as great as in the NR phase. Further, the percentage of graphic substitutions, indicating skilled use of graphic information, is twice as great as in the preceding phases. This increase in graphic substitutions, in conjunction with a return to frequent use of contextual information, is in agreement with the general expectations for the post-NR phase.

The data presented in Table 2 thus demonstrates that when children's errors are ordered in terms of phases defined by their non-response errors, related variations in other error types can be demonstrated. The incidence of contextual errors is as great before non-response errors become predominant as it is after they cease to be predominant. When non-response errors are predominant, the incidence of contextual errors is reduced proportionately. However, there are marked changes in the incidence of graphic substitution errors that cannot be accounted for simply by changes in the proportion of non-response errors. The percentage of graphic substitutions is not reduced when the percentage of non-response errors is large in the NR phase. And the percentage of graphic substitutions doubles when the percentage of non-response errors is again low in the post-NR phase. These findings follow from the hypotheses proposed in this study, suggesting that the NR phase represents a shift from depending predominantly on the use of contextual information for word identification to predominant use of graphic information, and that after this phase of predominant use of graphic information, the child will again make more use of contextual information to identify words, but also show increased skill in using graphic information in the form of increased proportions of graphic substitutions.

However, the expected division of the post-NR phase into two phases, one with graphic substitutions dominant, and one with contextual errors dominant, did not occur. There were no important changes as a function of time in any of the three phases.

Failure to find these two phases may follow from a number of possible explanations. First, my original hypotheses may be wrong--there is no phase when children emphasize a high degree of skill in using graphic information. Second, I had expected that in the last phases, children would show a greater flexibility in strategies, emphasizing contextual information when reading easy material and graphic information when reading more difficult material. Evidence for this hypothesis is presented in section XI of this chapter. Unfortunately, appropriate data for examining this hypothesis on a month-by-month basis is not available, as noted in Chapter III. (page   ). Thus, if consistently very easy material for each child had been used, we might have seen the predicted decline in graphic substitutions accompanied by increases in contextual errors as children spent months in the post-NR phase.

VII

Constraints on Error Responses

A partial explanation for the ordering of these periods was proposed in Chapter I. I suggested that in the pre-NR period, the child is imposing strong constraints on his responses--notably that he will not say any word he has not learned is a "reading" word. This, combined with normal English grammatical constraints, could well limit his responses to the correct word frequently when the total corpus of "reading" words is small. As he moves through the NR period and develops some small skill in using graphic information, he might relinquish the "reading" words constraint and be prepared to give any word he knows or even a pseudo-word if a series of letters seemed to decode that way. If this notion is correct, we should see higher incidences of errors that are words not previously learned during the NR and post-NR periods than in the pre-NR period. This in fact proved to be the case. One percent of the substitution and insertion errors made by children in the pre-NR period were not previously learned words. Six percent of the substitution and insertion errors made during the NR period were not previously learned words. It is, of course, possible that some words were learned outside of school. I do not believe, however, that out-of-school learning could account for shifts of this size.

VIII

The Relationship Between the Timing of Phases and Reading Ability at the End of the Year

Turning now to the relationship between ability and development of reading strategies, we will consider two questions. First we will examine the relationship between the time when a child changes from one phase to another and his reading ability at the end of the year. Secondly, we will see if children of differing abilities show similar strategies when they are in the same phase.

Table 33 shows when children began the NR phase, and gives mean ranks based on oral reading accuracy in June.

Table 33

Mean June Reading Performance Ranks by Months in Which NR Phase Began

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	No NR Phase
Mean June Performance Rank	13.4	14.5	24.4	24.2	21.2	35.0	36.0	--	38.7
No. of Children	16	3	7	3	4	3	3	0	3

Table 33 shows clearly that, in general, the earlier a child moved into the NR phase, the better his reading performance was at the end of the first grade. In order to test this observation statistically, Table 34 was prepared. The 39 children who did move into the NR phase were divided into three groups on the basis of end-of-year performance ranks. The first group contained the first 14 children, the middle group the middle 14, and the last group, 11 of the last 14 children. Three children among the last 14 never began the NR phase.

A Chi-square analysis of data in Table 34 shows that the association of the most able children with the earliest months, and the least able children with the latest months was most unlikely on a random basis. (Chi-square = 20.74; Chi-square .005 for 6 d.f. = 18.5). Thus this analysis confirms the apparent trend observed in

Table 34 for children who were reading well at the end of the year to begin the NR phase earlier than children who were not reading well at the end of the year.

Table 34

Numbers of Children of High, Average and
Low Reading Ability Beginning the NR Phase
at Various Points in the Year

	Months NR Phase Began				
	Oct.-Nov.	Dec.-Jan.	Feb.-Mar.	Apr.-May	All
High Read. Abil.	11	1	2	0	14
Avg. Read. Abil.	6	7	1	0	14
Low Read. Abil.	2	2	4	3	11
All	19	10	7	3	39

There is a less clear relationship between the month a child ended the NR phase and his reading ability at the end of the year. Table 35 shows mean ranks by the month the NR phase ended, and Table 36 shows the relationship between ability groups and months in which children ended the NR phase.

Table 35

Mean June Reading Performance Ranks
by Months in Which NR Phase Ended

	Month NR Phase Ended							
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
Mean June Perform. Rank	11.7	16.5	2.0	14.3	23.9	26.2	17.1	28.6
No. Child.	3	4	1	5	8	4	7	7

There is some association between ability groups and the month the NR period ended. The Chi-square for Table 36 is 10.4 which just misses significance at the .10 level (Chi-square .10 for 6 degrees of freedom = 10.6). The lower level of association between ability and the month the NR phase ended suggests that the length

Table 36

Numbers of Children of High, Average, and Low Reading Ability Ending the NR Phase at Various Points in the Year

	Month NR Phase Ended				
	Oct.-Nov.	Dec.-Jan.	Feb.-Mar.	Apr.-May	All
High Read. Abil.	4	3	2	5	14
Avg. Read. Abil.	2	3	6	3	14
Low Read. Abil.	0	0	4	7	11
All	6	6	12	15	39

of the NR phase may not be associated with ability. To examine this possibility, Table 37 was prepared, comparing ability groups by the length of the NR phase.

Table 37

Numbers of Children of High, Average, and Low Reading Ability with Various Lengths of NR Phase

	Length of NR Phase in Months				
	1-2	3-4	5-6	7-8	all
High Read. Abil.	6	3	2	3	14
Avg. Read. Abil.	6	4	3	1	14
Low Read. Abil.	6	4	1	0	14
All	18	11	6	4	39

Inspection of Table 37 clearly indicates no relationship between ability groups and the length of the NR phase. The Chi-square for Table 37 is 4.4, far below the Chi-square value for non-random association for 6 degrees of freedom.

IX

The Relationship Between Reading Ability at the End of the Year and Distribution of Errors Within Phases

It is, of course, possible that the patterns of error types seen in the different phases simply reflect overall ability differences. We have just seen that those children who reached the post-NR phase were more able than those who did not, and that those who reached the NR phase were more able readers than those who did not progress that far. In order to see whether children in the same phase did in fact make similar kinds of errors, I examined distributions of error types in the three phases within the three different ability groups (Table 38).

Table 38

Percentages of Errors Indicating Use of Contextual and Graphic Information by Ability Groups and Phases

	Ability Groups			
	Lowest Third	Middle Third	Highest Third	All
Pre-NR Phase				
% Contextual	56	50	57	55
% Graphic	43	31	52	40
% Non-Response	28	20	33	26
% Graphic Sub.	15	10	19	14
No. of Errors	258	117	21	391
No. of Children	13	9	5	
NR Phase				
% Contextual	26	22	25	24
% Graphic	72	78	87	79
% Non-Response	63	67	67	66
% Graphic Sub.	8	12	20	13
No. of Errors	260	316	205	770
No. of Children	11	14	14	
Post-NR Phase				
% Contextual	54	52	60	54
% Graphic	55	70	64	64
% Non-Response	39	38	29	35
% Graphic Sub.	16	32	36	29
No. of Errors	225	389	185	787
No. of Children	7	12	13	

The data in Table 38 shows both similarities and differences in error types made by the three ability groups in the three phases. Percentages of contextual errors are very similar in all three groups. So are percentages of non-response errors, except in the post-NR phase in which children in the most able group appear to make somewhat fewer NR errors than children in the groups.

However, percentages of graphic substitutions, indicating skilled use of graphic information, show differences associated with ability groups as well as with phases. The least able children show no real increase in the percentage of graphic substitutions in the NR and post-NR phases. The drop to eight percent graphic substitutions in the NR phase is proportionate with the drop in the number of response errors (errors which are not non-response errors).

This could lead to the suggestion that, at least for the least able group, the whole phenomena of phases is purely an artifact of arbitrary ordering of the data. However, the fact that the months when NR errors occur are different for this group than the other groups, and the fact that the percentages of non-response errors differs before and after the NR phase argue against this suggestion.

These differences in the percentages of graphic substitutions in the least able group in comparison to the other two groups does suggest that children who do not learn to read very well differ from other children primarily in their capacity to master the use of graphic information. This hypothesis will be discussed further in the next chapter.

X

Reading Ability, Passage Difficulty, and the Distribution of Error Types--End of the Year Data

This section is concerned with the findings on the influence of ability and passage difficulty on reading strategies at the end of the year.

Reading ability was indexed by dividing the children (from both Project Literacy (PL) and non-Project Literacy (non-PL) classes) into four groups: those who could successfully read only the easiest of four graded passages; those who could read the first two passages; and so on (see Section IV).

Then for each passage, I sub-grouped members of each of these groups according to the percentage of errors they made. These subgroups included children making 1 to 4.5 percent errors, and children making 5 or more percent errors. Children who made more than 25 percent errors on a passage were stopped (see Section IV). The division between less than 5% errors and 5% or more errors is based on observation of the data--there appear to be interesting differences within these categories.

Table 39 shows overall results by passage and error rates. This table shows clearly the tendency for the percentage of contextual errors to decline with higher error rates while the percentage of

Table 39

Percentages of Errors Indicating Use of Graphic and Contextual Information by Error Rate, and Passages of Varying Difficulty June, 1967

	Passages									
	I easiest		II		III		IV hardest		All	
(error rate %)	1-4.5	5.0+	1-4.5	5.0	1-4.5	5.0	1-4.5	5.0	1-4.5	5.0
% Contextual	73.3	47.5	64.4	36.3	56.2	34.5	59.4	35.7	66.5	38.4
% Graphic	41.5	61.2	61.0	77.7	68.8	82.8	73.0	87.8	56.5	77.0
% Non-Resp.	10.0	30.7	25.2	46.9	34.4	50.4	34.5	44.6	22.0	43.9
% Grap. Sub.	31.5	29.5	35.7	30.8	34.4	32.4	38.5	43.7	33.8	32.7
No. Errors	44	222	47	191	19	435	18	187		
No. Children	30	27	31	24	8	32	8	17		

graphic errors increases. Looking at the two types of graphic errors, non-responses and graphic substitutions, we see that the percentage of non-responses increased with the higher error rates on all passages. The percentage of graphic substitutions appear to have increased only on passage four. However, we shall see that when these data are broken down by ability groups as well as passages, the percentage of graphic substitutions also increases consistently with higher error rates (Table 41). We shall also see that other differences in distributions of error types involve differences between ability groups.

Looking at the effects of ability groups and error rates on error types, (Table 40) the same general trends noted in the different passages can be seen. The percentage of contextual errors declines with error rate increases, and the percentage of graphic errors increases with error rate increases.

However, there are several important differences between ability groups. The most important of these are the high percentage of contextual errors and low percentage of non-response errors in the least able group at the high error rates. Compared to the other three groups, children in this group apparently made less of a shift from using contextual information towards using graphic information when faced with difficult material. No child in this group made fewer than five percent errors.

The other three groups also show differences in the percentages of contextual errors at low error rates and graphic subsitutions at both error rate levels. Finally, there is a difference in the

Table 40

Percentages of Errors Indicating Use of Contextual and Graphic Information by Error Rates and Ability Groups (June, 1967)

	Ability Groups							
	I(least able)		II		III		IV(most able)	
	easiest passage only		read first two passages		read first three pass.		read passages	
Error rate %	1-4.5	5.0+	1-4.5	5.0+	1-4.5	5.0+	1-4.5	5.0+
% Contextual	--	53.5	48.3	39.0	50.5	34.2	73.3	36.9
% Graphic	--	60.1	55.0	71.5	18.4	80.6	61.2	85.2
% Non-Resp.	--	27.5	41.7	45.2	32.1	49.3	18.8	42.9
% Gra. Sub.	--	32.6	13.3	25.1	44	31.2	40.4	42.3
No. Errors	--	133	14	249		348	70	305
No. Children in Group	--	10	23		22		26	

percentages of non-response errors at the lower rates. Put together, these differences point to the same conclusions:

1. That the most able readers make the greatest use of contextual and graphic information at low error rates.*

2. The most able readers' use of graphic information showed a greater proportion of graphic substitutions than the other groups, indicating greater skill in the use of graphic information.

The data discussed thus far confounds passages and ability groups. When these are sorted out, large differences in the distributions of contextual and non-response errors appear in the first two passages (Table 41). However, these differences also appear to be functions of passage difficulty when the data is ordered according to the last passage a group could read (Table 42).

What we see is that there are marked similarities in the distributions of contextual and non-response errors when we look at the last passage each group was able to read, the next to last, and so on. Ordering data in this manner seems to account for the large

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* This also implies overlapping use of contextual and graphic information on many substitution errors. Further examination of about one third of these children indicated that no-information errors were very rare, accounting for about two percent of total errors.

Table 41

Percentages of Errors Indicating Use of Contextual and Graphic Information by Error Rates, Passages, and Groups (June, 1967)

	Ability Groups							
	I (least able)		II		III		IV (most able)	
error rate %	1-4.5	5.0+	1-4.5	5.0+	1-4.5	5.0+	1-4.5	5.0+
Passage I (easiest)								
% Contextual	-	53.5	56.2	40.2	73.1	61.7	88.9	-
% Graphic	-	60.1	43.7	64.2	34.5	55.5	49.9	-
% Non-Resp.	-	27.5	31.2	40.2	2.5	8.3	5.5	-
% Gra. Sub.	-	32.6	12.5	21.3	32.0	46.7	44.4	-
No. Errors	-	133	10	76	20	13	14	-
No. Children	-	10	8	14	13	3	9	-
Passage II								
% Contextual	-	-	16.5	38.2	55.5	23.3	80.9	-
% Graphic	-	-	100.0	76.3	64.4	87.4	51.8	-
% Non-Resp.	-	-	83.5	48.6	32.2	24.7	9.5	-
% Gra. Sub.	-	-	16.5	27.7	32.2	52.7	42.3	-
No. Errors	-	-	4	173	24	18	19	-
No. Children	-	-	2	21	15	3	14	-
Passage III								
% Contextual	-	-	-	-	-	32.0	56.2	38.3
% Graphic	-	-	-	-	-	83.1	78.8	82.3
% Non-Resp.	-	-	-	-	-	56.9	34.4	40.9
% Gra. Sub.	-	-	-	-	-	26.2	34.4	41.4
No. Errors	-	-	-	-	-	317	19	118
No. Children	-	-	-	-	-	22	8	15
Passage IV (hardest)								
% Contextual	-	-	-	-	-	-	59.4	35.7
% Graphic	-	-	-	-	-	-	73.0	87.8
% Non-Resp.	-	-	-	-	-	-	34.5	44.6
% Gra. Sub.	-	-	-	-	-	-	38.4	43.2
No. Errors	-	-	-	-	-	-	18	187
No. Children	-	-	-	-	-	-	8	17

Table 42

Percentages of Errors Indicating Use of Graphic and Contextual Information by Error Rate, Ability Groups, and Passage Difficulty for Groups (June, 1967)

	Ability Groups							
	I (least able)		II		III		IV (most able)	
error rate %	1-4.5	5.0+	1-4.5	5.0+	1-4.5	5.0+	1-4.5	5.0+
Passage								
4th from most diff.								
% Contextual	-	-	-	-	-	-	88.9	-
% Graphic	-	-	-	-	-	-	49.9	-
% Non-Resp.	-	-	-	-	-	-	5.5	-
% Gra. Sub.	-	-	-	-	-	-	44.4	-
No. Errors	-	-	-	-	-	-	14	-
No. Children	-	-	-	-	-	-	9	-
3rd from most diff.								
% Contextual	-	-	-	-	73.1	61.7	80.9	-
% Graphic	-	-	-	-	34.5	55.5	51.8	-
% Non-Resp.	-	-	-	-	2.5	8.3	9.5	-
% Gra. Sub.	-	-	-	-	32.0	46.7	42.3	-
No. Errors	-	-	-	-	20	13	19	-
No. Children	-	-	-	-	13	3	14	-
2nd from most diff.								
% Contextual	-	-	56.2	40.2	55.5	23.3	56.2	38.3
% Graphic	-	-	43.7	64.2	64.4	87.4	78.8	82.3
% Non-Resp.	-	-	31.2	40.2	32.2	34.7	34.4	40.9
% Gra. Sub.	-	-	12.5	21.3	32.2	52.7	34.4	41.4
No. Errors	-	-	10	76	24	18	19	118
No. Children	-	-	8	14	15	3	8	15
Most Difficult								
% Contextual	-	53.5	16.5	38.2	-	32.0	59.4	35.7
% Graphic	-	60.1	100.0	76.3	-	83.1	73.0	87.8
% Non-Resp.	-	27.5	83.5	48.6	-	56.9	34.5	44.6
% Gra. Sub.	-	32.6	16.5	27.7	-	26.2	38.5	43.2
No. Errors	-	133	4	173	-	317	18	187
No. Children	-	10	2	21	-	22	8	17

differences in percentages of contextual and non-response errors observed between the different ability groups on the first two passages. (Except for the previously mentioned differences between the least able group and the other groups.)

In other words, the nature of a particular passage seems to have less to do with the kinds of errors that are made on it, than the difficulty of the passage for the reader.

This finding indicates that the dimension of "difficulty" of reading material is more complicated than I had originally thought. I had suggested that "difficulty" could be operationalized simply in terms of error rates. Children making high error rates were presumed to be encountering greater difficulty than children making low error rates. However, the data in Table 28 indicates that error rates alone are not sufficient to assess difficulty. The consistent changes in the relative use of graphic and contextual information at low error rates as the difficulty of passages increases for a child shows that "difficulty" can appear in other forms than simple error rate increases. However, the direction of changes in errors on more difficult passages (decreased percentages of contextual errors and increased percentages of graphic errors) is in agreement with my original expectations about the relationship between difficulty of reading material and strategies of information use. Contextual information becomes less useful for word identification on difficult passages and the reader must rely to a greater extent on graphic information.

In sum:

Good readers probably use both graphic and contextual information quite effectively. They can shift from an emphasis on contextual information when reading easy material to more use of graphic information on difficult material.

Average readers also use contextual information fairly effectively on easy passages. They are not able to make as effective use of graphic information when they encounter difficult passages as do good readers.

Poor readers over-use contextual information and under-use graphic information. They probably attend to too few features in words, depending too much on contextual constraints to identify words.

XI

Comparison of Error Distributions in Project Literacy Classes and Non-Project Literacy Classes

In order to compare the two Project Literacy classes (those studied throughout the year) with the four other first grade classes in the same two schools, some of the data presented in the preceding section was tabulated with separate percentages in PL and non-PL groups. I will present comparisons of error distributions by passage, error rate, and PL versus non-PL children; and error distributions by difficulty of passage (last passage read, next to last, etc.), ability group, error rate, and PL versus non-PL children since these analyses proved most fruitful in the preceding section.

Table 43 shows both similarities and differences between PL and non-PL classes. On the first 3 passages, the trends observed on Table 39 held up for both groups. The percentage of contextual errors were lower and the percentage of graphic errors higher at the high error rate level than at the low error rate level. However, at the low error rate level, the non-PL children tended to make proportionately more non-response errors and proportionately fewer contextual errors than the PL children. This trend becomes more pronounced on the more difficult passages.

Before discussing this difference, it will be useful to examine differences between PL and non-PL children in terms of ability groups and the most difficult passage they could read.

In Table 44, several of the trends noted in Table 43 can be seen. The *least* able children in both the PL and non-PL groups differ from all others in making proportionately more contextual errors and fewer non-response errors at high error rates on the most diffcult (and only) passage they could read, indicating less reliance on graphic information and more on contextual information than other children use in this situation. The *most* able children in both the PL and non-PL groups make proportionately more graphic substitution errors than children in other groups, indicating greater skill in using graphic information.

The tendency of non-PL children to make prportionately more non-response errors and fewer contextual errors at low error rates appears to be related to the difficulty of passages for groups. Note that the trend is not present on the two easiest passages for the most able children or the easiest passage for the next most able group.

There are several possible reasons why the more able non-PL children were more prone not to respond on more difficult passages than the more able PL children. First, they may have learned

Table 43

Percentages of Errors Indicating Use of Contextual Information and Graphic Information By Project Literacy versus Non-Project Literacy Children, Error Rates, and Passages (June, 1967)

	Passages and Children															
	I (easiest)				II				III				IV (most difficult)			
	PL		Non-PL		PL		Non-PL		PL		Non-PL		PL		Non-PL	
	1- 4.5 7	5.0+	1- 4.5	5.0+	1- 4.5	5.0+	1- 4.5	5.0+	1- 4.5	5.0+	1- 4.5	5.0+	1- 4.5	5.0+	1- 4.5	5.0+
% Contextual	72	53	74	44	75	41	55	34	62	35	50	34	100	34	35	37
% Graphic	41	56	42	65	46	77	78	77	55	81	75	83	44	86	90	88
% Non-Resp.	4	26	17	38	12	43	76	48	19	47	50	53	0	46	55	43
% Gra. Sub.	37	30	25	27	34	34	42	29	36	34	25	30	44	40	35	45
No. Errors	23	85	21	137	19	76	28	15	11	211	8	224	5	100	13	87
No. Children	13	11	17	19	14	8	17	16	4	17	4	20	3	7	5	10

Table 44

Percentage of Errors Indicating Use of Contextual and Graphic Information by Project Literacy vs. Non-Project Literacy Children, Errors, Rates, Ability Groups, and Passage Difficulty (in Terms of Last Passage Read, etc.)

	Ability Groups and Children															
	I (least able)				II				III				IV (most able)			
	PL		Non-PL		PL		Non-PL		PL		Non-PL		PL		Non-PL	
Error Rate % Passage	1- 4.5	5.0+	1- 4.5	5.0+	1- 4.5	5.0+	1- 4.5	5.0+	1- 4.5	5.0+	1- 4.5	5.0+	1- 4.5	5.0+	1- 4.5	5.0+
	-	-	-	-	-	-	-	-	-	-	-	-	80	-	100	-
4th from most diff.																
% Contextual	-	-	-	-	-	-	-	-	-	-	-	-	80	-	100	-
% Graphic	-	-	-	-	-	-	-	-	-	-	-	-	50	-	50	-
% Non-Resp.	-	-	-	-	-	-	-	-	-	-	-	-	10	-	0	-
% Gra. Sub.	-	-	-	-	-	-	-	-	-	-	-	-	40	-	50	-
No. Errors	-	-	-	-	-	-	-	-	-	-	-	-	8	-	6	-
No. Children	-	-	-	-	-	-	-	-	-	-	-	-	5	-	4	-
3rd from most diff.																
% Contextual	-	-	-	-	-	-	-	-	72	62	74	60	83	-	79	-
% Graphic	-	-	-	-	-	-	-	-	39	62	31	40	33	-	71	-
% Non-Resp.	-	-	-	-	-	-	-	-	0	12	5	0	0	-	17	-
% Gra. Sub.	-	-	-	-	-	-	-	-	39	50	26	40	33	-	54	-
No. Errors	-	-	-	-	-	-	-	-	10	8	10	5	6	-	13	-
No. Children	-	-	-	-	-	-	-	-	6	2	7	1	6	-	8	-

Table 14 (Continued)

	Ability Gropps and Children															
	I (least able)				II				III				IV (most able)			
	PL		Non-PL		PL		Non-PL		PL		Non-PL		PL		Non-PL	
Error Rate %	1-4.5	5.0+	1-4.5	5.0+	1-4.5	5.0+	1-4.5	5.0+	1-4.5	5.0+	1-4.5	5.0+	1-4.5	5.0+	1-4.5	5.0+
Passage																
2nd from mostddiff.																
% Contextual	-	-	-	-	50	48	58	34	78	33	39	18	62	30	50	44
% Graphic	-	-	-	-	25	55	50	71	43	100	73	80	55	87	75	78
% Non-Resp.	-	-	-	-	0	33	42	50	14	17	48	43	19	46	50	37
% Gra. Sub.	-	-	-	-	25	22	8	21	29	83	35	37	36	41	25	41
No. Errors	-	-	-	-	5	32	5	44	10	6	14	12	11	57	8	61
No. Children	-	-	-	-	2	6	6	8	7	1	8	2	4	6	4	9
Most Difficult																
% Contextual	-	56	-	53	33	42	0	36	-	38	-	26	100	34	35	37
% Graphic	-	56	-	62	100	74	100	77	-	79	-	88	44	86	90	87
% Non-Resp.	-	23	-	29	67	47	100	49	-	48	-	66	0	46	55	43
% Gra. Sub.	-	33	-	33	33	27	0	28	-	31	-	22	44	40	35	45
No. Errors	-	45	-	88	3	70	1	103	-	154	-	163	5	100	13	87
No. Children	-	3	-	7	1	7	1	14	-	11	-	11	3	7	5	10

different strategies from their teachers or texts. Second, and in my somewhat prejudiced opinion more likely, they may have responded differently to the testing situation. The PL children had been in individual reading sessions six times before these passages were taped. The non-PL children had not, to my knowledge, had previous experience with oral reading testing. In addition, the PL children were acquainted with the investigators who taped their reading while the non-PL children were not. The point of all this is that the non-PL children were probably under greater stress than the PL children, and were more concerned about making mistakes or wrong guesses.

In sum, then, children from classes other than those studied in detail throughout the year generally showed the same strategies of information use as functions of difficulty of material and oral reading ability as the children studied all year, except that in some cases children from other classes made proportionately more non-response errors and fewer contextual errors at low error rates.

XII

Summary

1. Most children pass through a phase when the majority of their errors are non-response errors. A non-response error involves stopping or not responding when the child encounters a word that he does not know. Two other phases may be defined as pre-non-response (pre-NR) and post-non-response (post-NR).

2. Sixteen of the 42 children studied were making predominantly non-response errors when we began our observations in October. All but three of the remaining children later moved into the NR phase. Thirty-two children eventually moved on to the post-NR phase.

3. The percentage of contextually acceptable errors is large in both the pre-NR and post-NR phases (55 and 54 percent respectively). During the NR phase this percentage falls to 24 percent.

4. The percentage of graphic substitution errors is about the same in the pre-NR and NR phases (13 - 14 percent). In the post-NR phase, this percentage rises to 29 percent.

5. There are small changes in the distribution of error types over time within phases. These are in the direction of approximating the next phase. However, these changes are not nearly as large as the changes between phases.

6. These data are taken as support for a theory interpreting the development of reading skill as advancing from an early emphasis on

the use of contextual information for identifying words (first phase) through a phase when graphic information is used predominantly but with little skill; followed by a phase in which contextual information is again much used, but in conjunction with more effective use of graphic information. This interpretation is based on the assumption that non-response error indicate an emphasis on using graphic information for word identification. The most important point here is that what is mainly seen during the development of reading is development of strategies for using graphic information. The capacity to use contextual information is present when the child begins to learn to read.

7. Children in the pre-NR phase restrict their responses to words they have been exposed to in reading to a much greater extent than children in the later phases. Only one percent of all substitution and insertion errors in the pre-NR phase were words the children had not already been exposed to in reading instruction. Six percent of substitution and insertion errors in the NR phase and nine percent of these errors in the post-NR phase were words the children had not already learned to read. This constraint is seen as part of an effort by the child to use contextual information which he is better prepared to use early in the year than graphic information.

8. In general, the more able the child's reading performance at the end of the year, the earlier he moves in the NR phase during the year.

9. At the end of the year, it was demonstrated that able readers make mostly (70 - 80 percent) contextual errors on easy passages, and when not making many errors. On harder passages, they reduce the proportion of contextual errors and increase the proportions of graphic substitution errors and non-responses. Readers of moderate ability show shifts in the same direction, but do not make as many graphic substitutions, suggesting that they have less skill in dealing with graphic information. Poor readers make proportionately more contextual errors and fewer graphic errors of both types than the others at high error rates.

XIII

Educational Implications

This study has, as I see it, two major educational implications. First, it suggests that encouragement of the early use of context and picture cues, as now recommended in most basal reader series (Chall, 1963, pp. 204-205) may well be ill-advised. Indeed, I would be inclined towards doing a considerable proportion of early reading training in situations providing no context at all, in order to compel children to use graphic information as much as possible.

As they show evidence of doing so (through accurate reading out of context) they would be given contextual material to read.

Another aspect of most current basal readers is highly repetitive sequences of words. These two are likely to enhance the child's use of guessing with little reference to graphic information.

The second major educational implication of this study is the possibility of using oral reading errors as a powerful diagnostic tool, both for regular and remedial reading. To be specific, a teacher could determine over-use of context information suggesting that teaching strategies aimed at increasing the child's use of graphic information be used.

Secondly, a teacher trained to use oral reading errors would recognize that non-response errors are themselves an indication of progress rather than weakness, early in the year. They may also be indicative of readiness for phonics instruction. (This last is very hypothetical.)

Thirdly, when there is some evidence of use of graphic skills, then the teacher might urge a child to read faster and to use context information in conjunction with graphic information for word identification. At this point, but not before, concern with "word for word" reading would seem to be appropriate.

Fourthly, the discovery that some children can be "false starters" suggests that the teacher must be alert to the possibility that a child who is apparently making progress in mastering graphic skills may shift away from the use of graphic information, and that this shift is apparently not desirable. Thus the teacher must be prepared to change her strategies in dealing with individual children as the need arises.

Finally, the developmental analysis of oral reading errors, as described in this thesis, may provide a useful technique for the evaluation of reading programs.

One caveat. The findings reported in this study are, of course, restricted to first graders. There is, in fact, evidence (as reported in Chapter II) that in higher grades it is remedial readers who make errors indicative of over-use or mis-use of graphic information. My own guess is that there are two factors involved here. One is that some readers seem to stay stuck on the use of strategies emphasizing context information at the expense of graphic information for much longer than is perhaps necessary. In a sense, they have started off on the wrong track. By later years, these children may be trying to master graphic skills, but within a framework of failure and disatisfaction with reading in general.

The other factor is that it is probably much harder for poor readers to master graphic information. Just why this should be so is not clear. There is evidence that children of low I.Q.'s have difficulty in visual discrimination learning (Zeaman and House,), and perhaps generally in extracting significant features and relationships from complex stimuli. (Gibson, 1968, Ch. XIV, discussing relationship between I.Q. and perceptual constancies.)

I believe it may be possible to develop procedures that could aid children in developing learning sets for coping with the discrimination problems in reading. But reading programs which encourage the child to avoid their weak area do not seem calculated to aid this kind of development.

My conclusion that the first priority in teaching reading should be the development of skills for using graphic information contradicts the views of Goodman (1965) and Lefevre (1964), who urge greater attention to the role of context in reading. Goodman, bases his conclusion on the observation that children can identify a much greater number of words when reading in context than when reading out of context.

In my study, we did not compare word recognition in and out of context. I would like to speculate, however, on how the increased skill in recognizing words in context might be related to the three phases described in this study.

If we first obtained two lists of words, those a child could read out of context, and those he could not; what frequency and quality of errors might be seen when words from each list were read in context by children in the different phases? I would expect children in the pre-NR phase to make a number of errors both on words they read correctly out of context and on words they could not read out of context. Errors on both types of words would presumably be contextual. The expectation that a number of words read correctly out of context would be missed in context follows from my hypothesis that pre-NR children are not attending very carefully to graphic information when they read contextual material.

I would expect children in the NR phase to show a sharp differentiation in the types on errors made reading in context on words read accurately out of context words not read accurately out of context. On words read accurately out of context, I would expect to see a few response errors, most showing evidence of use of contextual information, some also being graphic substitutions. These would be the response errors seen in the NR phase. I would expect that most of the errors made on words which could not be read out of context would be non-response errors.

In the post-NR phase, I would expect to see very few errors in context on words read accurately out of context. What few errors there might be would be predominantly contextual. Errors on words not read accurately out of context would either be predominantly graphic substitutions, some being also contextually acceptable; or non-responses. Again, there would be relatively few errors on these words. In many cases, I would expect these children to successfully combine their graphic skills with contextual information to correctly identify these words.

If these speculations are correct, they would confirm my view that mastery of the use of graphic information is the first priority in learning to read, rather than development of the child's application of contextual information to reading.